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## SUMMARY OF RECENT ABSTRACTS *

### VII. HELMINTHIASIS †

(Continued from p. 966)

*Hookworm Infection, etc.*

Hookworm infection is widespread in parts of Italy—for instance the Province of Salerno (GALLO, p. 1000), and near Messina (QUATTROCCHI and RUSSO, p. 464) where 35·6 per cent. of dispensary patients were infected and one-third presented definite clinical effects. URSO and MASTRANDREA (p. 179) have observed duodenal ulcer in hookworm infection, and discuss the relationship.

Some development of larvae of *A. duodenale* and *A. caninum* was observed by SAWADA *et al.* (p. 388) for about 6–10 days after injection into the yolk sac or allantois of the chick embryo.

HARADA (p. 804) has shown that hookworm larvae added to the soil in which radishes and other plants are grown can climb into the leaves, and that in conditions of warmth and high humidity as many as 8·1 per cent. of the larvae of *A. caninum* could be recovered from the various parts of the plant; the recovery of larvae of *A. duodenale* was much less. The same author (p. 805) shows that larvae of *A. caninum* can be taken up by the pulvilli or the bristles of flies. SHOUL (p. 559) claims that in Korean patients severe abdominal symptoms may be produced by the eating of vegetables whose surface is contaminated with hookworm larvae, but that ascariasis with abdominal pain cannot be distinguished from ankylostomiasis.

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* The information from which this series of summaries has been compiled is given in the abstracts which have appeared in the *Tropical Diseases Bulletin*, 1955, v. 52. References to the abstracts are given under the names of the authors quoted and the pages on which the abstracts are printed.

† For previous articles on helminthiasis in this series see the August and September issues of the *Tropical Diseases Bulletin* each year since 1939.

An intradermal test for hookworm infection, with an antigen consisting of a saline extract of dry worm substance, has been used by Vendramini and Magaudda-Borzì (p. 1000), who report that the test was positive in 98 per cent. of infected persons but that false positive results were given in 11·5 per cent. of healthy persons.

Janz *et al.* (p. 1106), as a result of investigations in Africans, conclude that in the early stage of hookworm infection a diminution of serum iron is the first observable change.

Trincão *et al.* (pp. 1105, 1106) studied erythrocytic porphyrins in hookworm infection. They were not able to find deficiency of vitamin B1 in Africans with hookworm, filariasis or sleeping sickness, or in healthy subjects.

Jara (p. 1106) was unable to find that hookworm infection was responsible for anaemia observed in schoolchildren in Angola; the most important factor in this anaemia is nutritional.

Brumpt and Ho Thi Sang (p. 1211) discuss the oedema which accompanies anaemia due to hookworm infection. In severe hookworm disease they have always found reduction in blood proteins; the albumin is reduced and the oedema seems to be directly related to the hypoproteinaemia. The oedema yields to anthelmintic treatment, which is an argument in favour of the part played by chronic haemorrhage in its aetiology; the effect of expulsion of the worms is as if forceps had been applied to bleeding vessels. In severe hookworm disease the patient may be very debilitated, and toxic anthelmintics should be avoided. Brumpt and Ho Thi Sang (p. 180) strongly advocate tetrachlorethylene, reporting cure in 50 per cent. with a dose of 3 ml. (in capsules) and in 85 per cent. with 6 ml., even in patients with heavy infections. The effect on *Ascaris* is also good. Carr *et al.* (p. 60) also advocate tetrachlorethylene in doses of 0·05–0·06 cc. per lb. body weight, to maximum doses of 4 or 5 cc. respectively. Dana *et al.* (p. 1211) similarly write favourably of tetrachlorethylene, but note that it was less satisfactory in *Ascaris* infection and had no significant action on *Trichuris* and *Hymenolepis*.

Lippi and D'Ercole (p. 915) have used (for adult patients) a mixture of hexylresorcinol 1 gm., tetrachlorethylene 4 cc. and ground-nut oil 15 cc. administered by stomach tube as an emulsion in 200 cc. of warm water, after sedation for 3 days with Luminal, papaverine, etc. In some patients 2–4 treatments of this kind were needed.

Sadeh (p. 557) reports a case of toxic encephalitis apparently due to oil of chenopodium used in the treatment of hookworm infection.

After tests of various naphthol compounds on a *Rhabdia* infection of toads (which resembles hookworm infection), Miura (p. 465) found that 1-bromo-$\beta$-naphthol was effective in *Ancylostoma* infection in man. Doses up to 4 gm. were given 2–7 times; side effects were slight. Kirchmair (p. 1212) used Vermella, a halogenated oxy-derivative of methyl isopropyl benzol, with success in a few cases.

In children André *et al.* (p. 388) find that the best results are obtained if they are given supplementary feeding (*e.g.* 40 gm. skimmed milk daily, reconstituted with 0·25 litre of water) before anthelmintics are given.

Observation of 40 patients with creeping eruption led Loewenthal (p. 1001) to the conclusion that the larvae appear to die in conformity with a general law of nature applicable to any population subjected to the action of unfavourable environment; there was little evidence that modern systemic treatment provided an environment less favourable for the larvae than normal skin. Larvae of *A. caninum* and *A. braziliense*, which are concerned in creeping eruption, were subjected by Ritchie and King (p. 388) to the action of a number of drugs and chemicals *in vitro*; the results are set out in the original abstract.

Jones and Abadie (p. 281) show that rhabditoid larvae of *Strongyloides stercoralis* can be found more often in a single specimen of duodenal fluid than in faeces of infected persons even after multiple examinations, but neither method alone is as efficient as both together. A fatal case of *Strongyloides* infection is described by Camain *et al.* (p. 1213). Coutinho *et al.* (p. 558) report that *Strongyloides* infection has been detected in up to 35 per cent. of persons examined in various surveys in São Paulo. They give an account of a number of cases and the treatment employed, noting that a specific agent has yet to be found. Chernin (p. 181) used diethylcarbamazine in treatment, with poor results.

Weinstein (p. 558) investigated the effect of cortisone on the immune response of the white rat to *Nippostrongylus muris*.

### *Ascaris Infection*

*Ascaris* infection is relatively common in childhood, and Jung (p. 181), as a result of the study of groups of worms recovered from patients heavily infected, concludes that the infection is usually contracted on one occasion only, or during a short period, by the ingestion of large numbers of eggs, rather than by freqent ingestion of small numbers of eggs. He thinks that larvae from newly ingested eggs fail to develop until the older worms are almost completely eliminated, and quotes work which suggests that larvae may confer a form of immunity on the host.

Intestinal helminthiasis is common in some children's institutions in Italy; Chignoli and Triggiani (p. 999) and Cassella and Pontrandolfi (p. 1107) found *Ascaris* frequently; *Enterobius*, hookworm, *Trichuris* and *Hymenolepis nana* were also found.

Widmaier (p. 61) notes that in Iran *Ascaris* often causes severe illness, and remarks that the abuse of opium may lead to difficulty in treatment by causing paralysis of the intestine, and that anthelmintics may be toxic in patients on poor diets.

Observations on the incidence and intensity of infection with *Ascaris* in part of Japan where night-soil is much used in vegetable gardens

indicate that re-infection appears some 2 months after treatment, and that there are seasonal fluctuations probably varying with diet and the time of applying the night-soil; PAN *et al.* (p. 389) regard the findings as indicating a relatively short life span.

Morphological differences between *Ascaris* of man and of the pig are slight, but ABDULRACHMAN and LIE KIAN JOE (p. 466) think that they are enough to differentiate *A. lumbricoides* and *A. suum*.

MOCHMANN (p. 287) states that eggs of *Ascaris* and *Enterobius* exhibit fluorescence, even if untreated, and that this can be detected by the fluorescence microscope.

SPRENT (p. 1001) reviews the literature on the incidence and pathological significance of nematodes in the central nervous system. Apart from the direct effects of the worms (adults or larvae) which enter that system, there may be others due to sensitization phenomena, and to the transportation of viruses. He (p. 1002) infected mice and other animals with various ascarid worms, and examined the central nervous system for larvae. He gives details of these experiments, which showed that larvae of several species did invade that system, frequently producing characteristic haemorrhages on the surface of the brain, and in some cases causing nervous symptoms.

MOORE (p. 282) discusses the lesions which may be caused by *Ascaris*, quoting cases of pneumonia, perforation of the oesophageal or intestinal wall, and of subacute peritonitis due to *Ascaris* eggs escaped from the intestine and causing reaction in the serosa.

In describing the surgical complications of ascariasis NÚÑEZ and BERIO (p. 466) mention that partial obstruction of the intestine was the most common, but that perforation of the appendix was also seen.

In Honduras HOEKENGA (p. 61) tried several drugs for *Ascaris* infection, but none of the results was outstanding. Of the single-dose treatments hexylresorcinol gave the best results (40 per cent. cures) and of the multiple-dose treatments diethylcarbamazine (80 per cent. cures).

The piperazine preparations have been much used for *Ascaris* infection. Diethylcarbamazine was found to be ineffective against hookworm and *Trichuris*, but although it is less valuable than other well known drugs against *Ascaris*, GABBARD *et al.* (p. 805) recommend it because it is convenient and not toxic. BOURREL (p. 1213) found it at least as effective, in daily doses of 12 mgm. per kgm. for 10 days, as thymol, oil of chenopodium or santonin for *Ascaris*, hookworm and *Trichuris*, but BRUMPT and HO-THI-SANG (p. 1108) did not find it of much value for *Ascaris*. They prefer piperazine hydrate or diphenyl acetate, in doses of 75 mgm. per kgm. daily for 2 days. Piperazine hydrate is advocated by WHITE (p. 63) and by VIANNA MARTINS and VIANNA MARTINS (p. 1214) who use a daily dosage of 50–75 mgm. per kgm. for 7 days.

Piperazine adipate is less toxic than the hydrate and has proved useful against ascarids in various animals. It is easy to administer, and preliminary experiments by DAVIES *et al.* (p. 64) indicate that it possesses

many advantages over other drugs. DUNN (p. 666) found diethylcarbamazine unsatisfactory for *Ascaris* and piperazine hydrate unsatisfactory for *Trichuris*, but piperazine adipate was effective against both. The daily dose of this last was about 75 mgm. per kgm. and all the drugs were given in courses lasting 3 days. For *Ascaris* infection HANNA and SHEHATA (p. 1110) used piperazine adipate in a total dose of 750 mgm. for each year of life up to 6 years, and 4·5 gm. from 6 years upwards, given in 4 equal divided doses after meals at intervals of 4 hours for 1 day. All the patients were cured, but there was no effect on hookworms or *H. nana*.

GOODWIN and STANDEN (p. 283) used piperazine citrate (Antepar, a syrup containing the equivalent of 100 mgm. of the hexahydrate per ml.) for the treatment of *Ascaris* infection in Africans. It is effective and non-toxic in a single dose, and they suggest 3 gm. for all patients except children weighing less than 20 kgm. (for whom 2 gm. are suitable), given before the evening meal, with a saline purge next morning. It is not known whether the drug acts on larvae in the tissues. Single-dose mass treatment may need to be repeated at intervals of one month for 4 months because the eggs can survive several months, and re-infections are possible. BROWN and STERMAN (p. 62) and BROWN (p. 284) write favourably of Antepar, the daily dose for children being 5–20 ml. for 2–5 days according to weight, each dose being given in two halves. SWARTZWELDER *et al.* (p. 916) gave 25–78 mgm. of the active substance of Antepar per lb. daily (in 2 or 3 doses) for 3–15 days with good results. They (p. 1108) also gave it as a single dose, equivalent to 70 mgm. of the hexahydrate per lb. to a maximum of 3 gm., with good results. PALLISTER (p. 1107) gave 50–103 mgm. of the citrate per kgm. daily (in 2 or 3 doses) for 3–5 days; for *Ascaris* the results were good, but hookworm eggs usually persisted.

STANDEN (p. 1004) has observed the effects of various dilutions of piperazine citrate, adipate and phosphate on *A. lumbricoides in vitro*.

TALYZIN (p. 65) treats ascariasis by introducing oxygen by duodenal tube, the dose being 1–2 litres, given slowly. It is followed in 2 hours by a saline aperient. The treatment needs care, but can be administered to out-patients, and is claimed to be effective. VORA (p. 806) has used a similar method with success, but (p. 1215) failed when using air instead of oxygen, concluding therefore that the oxygen has a specific effect.

GROSS and SCHMIDT (p. 1003) show that in *Ascaris* infection the action of corticotrophin and cortisone in reducing the resulting eosinophilia is only relative, and ceases when administration is stopped.

### *Gnathostoma Infection*

A case of pulmonary gnathostomiasis from Thailand is described by PRIJYANONDA *et al.* (p. 1129). MIYAZAKI (p. 565) writes of *Gnathostoma* infection in Japan, where the incidence appears to be increasing. Two

species of freshwater fish are incriminated as hosts of the larval stages, and cause infection when eaten by man. He (p. 1004) gives an account of the complex life history of *Gnathostoma spinigerum*, and the wide variety of hosts which may be involved in any stage.

### *Filarial Infections*

Winter (p. 1116) suggests that what is usually known as tropical eosinophilia may be regarded as an accentuated state of sensitivity in persons infected by filariae. Faure *et al.* (p. 409) discuss 3 cases of this condition in which intradermal tests with filarial antigens were positive though the blood was negative; 2 were treated with diethylcarbamazine and the tests became negative. The condition in these was probably of filarial origin. Galliard (p. 809) discusses eosinophilia in filariasis, pointing out that there is no relationship between eosinophilia and microfilaraemia or intensity of clinical symptoms. There seems to be a racial difference in eosinophilia, not only in respect of the filariae but also in relation to the reaction to corticotrophin and cortisone. Deschiens and Floch (p. 563) investigated the effect of corticotrophin on parasitic eosinophilia in children; the eosinophil count was not reduced in most cases, and in most the leucocyte count was increased.

*Wuchereria bancrofti*:—

Jordan (pp. 467, 668) discusses the foci of high incidence of *W. bancrofti* infection in Southern Tanganyika, on the coast and where high temperature is combined with high humidity, as around the great lakes. He (p. 467) shows that the endemic area of *D. perstans* infection is smaller than that of *W. bancrofti*. He (p. 918) found that microfilaraemia with *W. bancrofti* only slightly affected the capacity for work but that in a hyperendemic area the incidence of hydrocele was high and elephantiasis was often accompanied by incapacitating attacks of pain. The incidence of *W. bancrofti* seems to be related to the incidence of abortions, and chronic hydrocele affects fertility. In southern Tanganyika he (p. 808) found a steady increase in the microfilarial density of *D. perstans* with age, suggesting that there is little or no suppressive mechanism. With *W. bancrofti*, however, the relationship was more erratic, and there appears to be a suppressive mechanism to reduce or annihilate the microfilariae in the blood, especially in cases of elephantiasis.

McFadzean (p. 560) reports a survey in Gambia in which microfilariae of *W. bancrofti* were found in 38 per cent. of persons in a coastal village, and less in an inland and a swamp village; males were rather more commonly affected than females, and microfilariae were found in only 1 child under 5 years. For *D. perstans* the general incidence was 68 per cent. inland, which was much higher than on the coast or in the swamp village. In a village in Casamance, French West Africa, a survey gave similar results to those of the coastal Gambian village.

In certain villages of Liberia Burch and Greenville (p. 807) detected *W. bancrofti* larvae in 10·2 per cent. of night blood specimens; the highest rates were found along the coast. They suspect that *Anopheles melas* is implicated in transmission. *D. perstans* was also found, but much more rarely. On the coast of Liberia Gelfand (p. 808) discovered natural filarial infection in 4 species of *Anopheles*, and considered that *A. gambiae* was probably the main vector in the wet season and *A. melas* in the dry season and the beginning of the wet.

In the Gold Coast Muirhead-Thomson (p. 740) found natural filarial infection in *A. gambiae* and, to a less extent, in *A. funestus*. Feeding experiments to try to identify the true infecting reservoir did not indicate that one age-group was more important than another, and there was no clear relationship between the number of larvae found per infected mosquito and the density of microfilariae in the donor.

In Mauritius *Culex fatigans* and *Anopheles gambiae* have been found to be vectors of *Wuchereria bancrofti* in nature; Halcrow (p. 182) gives figures of infected specimens caught, and notes that areas of high incidence have low populations of *C. fatigans*, but relatively high populations of *A. gambiae*, but that *A. gambiae* is much deviated to cattle. *C. fatigans* is therefore probably the more important vector.

In a group of mill workers in Calcutta, who came from various areas, Chernin (p. 389) found microfilariae of *W. bancrofti* in 5·5 per cent., which is lower than the general Calcutta rate. In Malabar there are ancient communities of Jews, some of whom wish to migrate to Israel. Reitler and Yoffe (p. 1111) examined all the inhabitants of 5 of these communities, finding microfilaria rates up to 20 per cent. (up to 59 per cent. in males). The danger of spread of the infection to Israel is not regarded as great, but as a precaution all immigrants from endemic areas are to be given diethylcarbamazine on arrival and every 6 months for 2 years.

In Mangalore, South India, Krishnaswami (p. 1110) found microfilariae in 15 per cent. of the population examined, the rate reaching a maximum at about 20 years of age, and thereafter remaining steady. Developmental stages were found in *Culex fatigans* only, the infection rate reaching 17·6 per cent. in May. There are abundant breeding places.

In the Pescadores islands *W. bancrofti* infection is common, a microfilaria rate of 17·7 per cent. being recorded in one village by Demos *et al.* (p. 1044). *Culex fatigans* is common and is probably the vector. A focus of *W. bancrofti* infection is reported from Japan by Arakawa *et al.* (p. 669).

In Port Limón, Costa Rica, Lieske (p. 66) found microfilariae of *W. bancrofti* in 21 of 137 persons.

Rachou *et al.* (p. 185), in Brazil, for the first time found *Aëdes scapularis* infected with *W. bancrofti* in nature.

*Culex fatigans* is the chief vector of *W. bancrofti* in some areas, and

thrives best in puddles polluted with sewage. PARTHASARATHY and KRUSE (p. 183) show that organic solids interfere physically with the contact of larvae with particles of DDT used as a larvicide, and that, up to 1,000 p.p.m. total solids, pollution favours mosquito production, though over this figure there is inhibition of mosquito production. DDT should be applied on the basis of volume of water, not surface area, and a dose of 0·2 p.p.m. was found satisfactory at all ranges of solids up to 5,000 p.p.m. in the laboratory.

For the control of *C. fatigans* in an experimental area CHARLES (p. 564) sprayed houses with dieldrin at the rate of about 16 mgm. per sq. ft. Breeding sites were also treated with dieldrin powder (1 p.p.m.) each week. These measures were successful in controlling the mosquito.

Antigens prepared from *Dirofilaria immitis* and *Dracunculus medinensis* were used by FLOCH (p. 562) for intradermal tests in filariasis (*W. bancrofti*). Neither was specific, the reactions being only group reactions, and the results differed considerably from those found by searching the blood for microfilariae.

JORDAN (p. 1005) considers that both elephantiasis and hydrocele may be caused by obstruction in the lymphatic drainage of the parts involved. Treatment with diethylcarbamazine may cure hydrocele in a proportion of cases.

DASTUR (p. 390) reports a case in which fragments of microfilariae, with surrounding cellular reaction, were found in the brain. He discusses the origin and the pathological process involved.

The South Pacific Commission (pp. 467, 468) has published 2 brochures on the distribution of filariasis in the South Pacific. The first is an annotated bibliography on the epidemiology of the disease, and the second is an illustrated summary of the distribution of microfilarial infection, elephantiasis, the two forms of *W. bancrofti* and the vectors.

MARKS (p. 839) has published a review of the *Aëdes scutellaris* subgroup, and a study of variation in *Aëdes pseudoscutellaris*.

MANSON-BAHR (p. 1121) remarks that in the Central and South Pacific, where *W. bancrofti* is non-periodic, the vector, *Aëdes polynesiensis*, is mainly a rural mosquito which clings to herbage in the bush and bites by day. It is rarely found in houses, and this probably accounts for the fact that men working on plantations are constantly more heavily infected than women, except when the women work in the plantations.

A study of the bionomics of *Aëdes polynesiensis* by INGRAM (p. 184) shows that it is well adapted to its natural habitat, would feed on any animal offered (including frogs) but preferred man, and can survive adverse conditions which would be fatal to many other mosquitoes. It appears to be capable of surviving in areas where man is absent. JACHOWSKI (p. 284) reports a study of the bionomics of this mosquito in American Samoa. It is common in banana groves, and avoids clearings; its range of dispersal is normally small (100 yards); seasonal fluctuation is not appreciable; it is not found resting in houses; man is the preferred

host but it will feed on pigs, horses, chickens and dogs. It is a potential vector of dengue.

In American Samoa JACHOWSKI and OTTO (p. 1114) found microfilariae of the non-periodic form in 20 per cent. of the population examined; no children under 5 were positive, and rates in children up to puberty were equal, though the rates in adult males exceeded those in females, reaching 50 per cent. at age 35–39. These differences probably reflect differences in exposure to infection. Transmission appears to be sylvatic, whether within or without the villages, and the rates in cleared villages are lower than in uncleared. In bush environments the differences between the rates in males and females are less marked than in the cleared villages. MCCARTHY and FITZGERALD (p. 469) report a survey of a village in Western Samoa in which the incidence of microfilaraemia and filariasis rose from early childhood to almost 75 per cent. at ages over 50. Men were more often affected than women, as has been noted before, and there is evidence to suggest that incidence has fallen somewhat since the early surveys were made by other observers. The cause of this may have been the increased clearing of the vegetation in the village areas, so that *Aëdes polynesiensis* is now being driven further into the bush and further out of contact, particularly with the women.

In French Oceania, for the non-periodic form of *W. bancrofti*, only *Aëdes polynesiensis* was found by ROSEN (p. 1112) to harbour infective larvae; it was a good vector. For the periodic form *C. fatigans* was a good vector. The microfilaria rate rose to a maximum at 24 years in males and at 50–54 in females. In feeding experiments a direct correlation was found between the increasing microfilarial density of the infected host and the infections induced in *polynesiensis*; this mosquito can be infected by feeding on persons with low microfilarial counts. The author took steps to differentiate all stages of *W. bancrofti* and *Dirofilaria immitis* in *polynesiensis*, in which both worms develop successfully.

Although *Aëdes pseudoscutellaris* and *Aëdes polynesiensis* show certain morphological and biological differences, ROZEBOOM and GILFORD (p. 184) show that they can interbreed and that the hybrid populations can continue almost indefinitely, though members of one population will mate more readily among themselves than with members of the other. Most of the hybrids are intermediate in morphological characters. It is difficult to understand how they can exist in Fiji in specifically distinct populations unless selective mating keeps them apart, and they may yet have to be relegated to some infra-subspecific category. WOODHILL (p. 669) also has succeeded in crossing *Aëdes polynesiensis* and *Aëdes pseudoscutellaris*; the hybrids were fertile.

BACKHOUSE and WOODHILL (p. 561) investigated the potentialities of mosquitoes of the *Aëdes scutellaris* complex as vectors of *W. bancrofti* from New Caledonia, finding that only *A. s. pseudoscutellaris* was a good host. In 1 of 40 *Culex fatigans* fed on a donor, development of the larva was observed almost to the third stage; the rest were negative.

In dissections of wild mosquitoes in Fiji Symes (p. 1006) found filarial infection in a high proportion of *Culex annulirostris* and *Aëdes fijiensis*, but in a much lower proportion of *Aëdes polynesiensis*, *Aëdes pseudoscutellaris* and *C. fatigans*. Most of the infections were probably due to *W. bancrofti* of the non-periodic form. In a comment on this work Manson-Bahr (p. 1006) remarks that these findings are not in agreement with those of various other workers who have found that this infection is transmitted almost entirely by *polynesiensis* and *pseudoscutellaris*. If the implications of Symes's work are correct, a re-orientation of suppressive measures will be needed.

*Wuchereria malayi*:—

Chow *et al.* (p. 919) found that pentachlorophenol is a satisfactory herbicide for *Salvinia*, a host of *Mansonia* species.

*Loa loa*, *Dipetalonema perstans*, *etc.*:—

A symposium of papers read at the Royal Society of Tropical Medicine and Hygiene (p. 1117) deals with loiasis. Gordon summed up the investigations recently undertaken by the Liverpool School of Tropical Medicine in the Cameroons, where it seems probable that strains of *Loa* in monkeys are pathogenic for man, being transmitted by species of *Chrysops*; in other words that the transmission may be from monkey to monkey in the forest canopy (by *C. langi* and *C. centurionis*), from monkey to man near human habitations (by *C. silacea* and *C. dimidiata*), and from man to man when the monkey reservoir is absent. Crewe has studied the breeding places of *Chrysops*, muddy streams and swamps. Oldroyd commented that the ability to tolerate and transmit the microfilariae of *L. loa* is not specific, but that most species of *Chrysops* can do so; the effective vector is the species whose behaviour brings it into contact with man at the relevant intervals. Duke stated that *C. silacea* is the most important vector, and is attracted to wood smoke; this species probably transmits from man to monkey and *vice versa*. He has observed a nocturnal periodicity in the monkey *Loa*. Buckley remarked that there are still some morphological and developmental problems to be solved in relation to *L. loa*. Hawking distinguished a passive phase of microfilariae, when they appear in the blood (daytime in the case of *Loa*), and an active phase when they accumulate in the capillaries of the lungs. He describes attempts to determine the stimulus responsible for microfilarial periodicity, but without success. Kershaw thinks that the complex of hosts, parasite and vectors has reached stable equilibrium at a high level of incidence and intensity in man in small villages in the intact tropical rain forest in which live the canopy-dwelling monkeys, but the complex is very sensitive to changes in environment. He discussed the possibility of a mathematical model which would include the various factors.

Duke (p. 1124) reports a study of the biting habits of *Chrysops* at

various heights in forest. In the true canopy (92 feet) biting becomes marked in the morning, but not until midday at 28 feet, when there is some migration from the higher levels. There is a morning and an afternoon peak in the true canopy. Infection rates in a small number of flies caught at various levels were 3·6 per cent. at 130 feet, 4·1 at 92, 8·0 at 28, and 6·9 per cent. at ground level.

Kershaw *et al.* (p. 810) in the Cameroons found that the most effective potential reservoir of infection of *Chrysops* with *L. loa* was the middle-aged and elderly inhabitants of villages in the forest and the forest fringe. The greatest contribution from man to the infection of the fly, and thus to the maintenance of the parasitic complex, is from infections resulting from continuous exposure for 30–40 years or more.

Kershaw *et al.* (p. 186) studied the survival of *Chrysops*, finding that in wild-caught flies mortality increases with age in such a way that the logarithm of the rate is directly proportional to age. Longevity under laboratory conditions was not affected by the development of microfilariae of *L. loa* or the ingestion of *D. perstans*, but transmission to the definitive host of the infective form of *L. loa* after development in *Chrysops* was associated with high mortality in the fly. Kershaw and Duke (p. 186) counted the embryos of *L. loa* in infected *Chrysops silacea*, finding that the numbers increased in general with the length of time the worms had had in which to develop before the fly died. The number of infective forms found in flies was similar to the number taken in. Individual flies have different chances of survival and associated different abilities to support the development of a parasite.

Although one cannot be certain of the numbers of microfilariae a single *Chrysops* ingests, even if the amount of blood and its microfilarial content are known, Kershaw *et al.* (p. 1125) show that there is a logical relationship between the actual and expected intakes of groups of flies; in the case of *L. loa* the actual intake is about half the intake which would be expected from the number of microfilariae in the blood; in the case of *D. perstans* it is more.

Duke (p. 471) shows that *Chrysops zahrai* can become infected with *L. loa*; it may be capable of acting as a vector, but is probably less efficient than *C. silacea*.

Crewe (p. 67) has been able to show that *L. loa* can develop to mature infective forms in female *Chrysops langi*.

Rageau *et al.* (p. 1152) give an account of the Tabanidae of the French Cameroons, including *C. dimidiata* and *C. silacea*, which are accepted as important vectors of *L. loa*.

Gordon and Webber (p. 811) describe a technique for detecting scanty microfilariae in large volumes of blood by the addition of heparin, dilution with distilled water, addition of formalin, filtration through a wire mesh of 23 $\mu$, which traps the killed larvae, and centrifugation of the deposit thus formed. This method was found to detect *L. loa* in 46 per cent.

of a group of West African people, whereas thick blood film found only 28 per cent. positive.

In a large number of examinations of blood and skin scarification fluid carried out in French West Africa Pfister (p. 389) found *D. perstans* in 31 per cent., *O. volvulus* in 5·7, *W. bancrofti* in 3·8, and *D. streptocerca* in 0·1 per cent. He discusses the geographical distribution of these parasites.

Examination of *Culicoides austeni* and *C. grahami* after they had fed on persons infected with *D. perstans*, and a consideration of the relatively low infection rates found in *C. grahami*, indicated that the microfilariae do not survive well in this fly. Nicholas and Kershaw (p. 66), however, state that though there is no justification for assuming that it is not a vector in nature, it is significant that no naturally infected specimens have been found in the British Cameroons, whereas naturally infected *C. austeni* have been collected.

Duke (p. 470) studied the uptake of *D. streptocerca* by *Culicoides grahami* after feeding on infected persons; the flies were infected only after feeds on the chest and back. Development to the infective forms could take place in *C. grahami* in spite of the fact that *D. perstans* microfilariae were also taken up.

*Onchocerca volvulus*:—

The WHO Technical Report No. 87 (p. 564) deals with onchocerciasis and consists of a brief review of present knowledge, together with 2 papers on techniques—one for testing susceptibility of larvae of simuliids to insecticides, and the other for estimating the amount of river discharge.

Onchocerciasis is prevalent in various parts of Angola, where Cambournac *et al.* (p. 1126) found microfilariae in 32 per cent., skin manifestations in 38 per cent., nodules in 3 per cent., ocular changes in 11·4 per cent. and blindness in 6 per cent. Elsewhere in Angola Leite *et al.* (p. 1126) found microfilariae in 57·4 per cent. and other changes in proportion. Larval filariae were detected in *Simulium damnosum*.

A survey in Guatemala by Burch (p. 919) showed that half the adults examined had microfilariae of *O. volvulus* in the skin, one-fourth had palpable nodules (mostly on the head), 2·2 per cent. were blind in one or both eyes and visual acuity was diminished in more than one-third of the persons tested, 15·9 per cent. had alterations of the cornea or limbus and 6·7 per cent. had iritis or iridocyclitis.

Onchocerciasis is very prevalent (33–85 per cent.) in part of Northern Nigeria and Crosskey (pp. 68, 1127) found infection in 19·7 per cent. of *Simulium damnosum* there. He did not find any correlation between the density of the fly population and the infection rate. *S. damnosum* is markedly anthropophilic, biting throughout the day out of doors and sometimes in houses. There are two peaks of density of this fly, but in the dry season when many rivers fail the flies survive near the larger rivers, which continue to flow, and in the flood season breeding is

temporarily reduced. Flies may be caught up to 7 miles from breeding places.

Nettel (p. 1127) finds that microfilariae of *O. volvulus* from the skin of untreated patients have an average length of 247·8 $\mu$ and breadth of 5·63 $\mu$.

Mazzotti (p. 187) has found that skin biopsy is rather more efficient than scarification as a means of diagnosing onchocerciasis.

Ikejiani (p. 669) used an antigen from *Dirofilaria immitis* for an intradermal test in onchocerciasis but found that false positive reactions were given by uninfected persons so often that the test was useless. In comment Hawking states that a better test is to administer a small dose (*e.g.*, 50 mgm.) of diethylcarbamazine, which causes a febrile reaction with pruritus and swelling of the inguinal glands if onchocerciasis is present.

Hughes (p. 390) has demonstrated microfilariae of *O. volvulus* in the testes of several bodies brought to autopsy; this finding may be related to the serious depopulation which has been observed in the affected areas of the Gold Coast. Invasion of the testes has not been reported before.

Diethylcarbamazine is used in treatment. Morales Cisneros (p. 68) gives one dose of 4–10 mgm. per kgm. each day for 10–15 days, and reports good results especially in patients whose nodules had first been extirpated. Ikejiani (p. 472) used it in 2 African women with histories of frequent abortions; both subsequently gave birth to healthy infants. Like other workers he (p. 670) notes that diethylcarbamazine destroys the microfilariae but not the adult worms, and he (p. 472) has used it successfully in association with suramin. This is well tolerated though skin lesions sometimes reappear. In French West Africa Masseguin *et al.* (p. 1006) use this combination and claim cure in about 70 per cent., noting that the remaining 30 per cent. may represent some re-infections rather than failures. Monthly administration of 0·3 gm. diethylcarbamazine may be effective prophylaxis. For ocular involvement D'Haussy *et al.* (p. 919) give 4 courses of diethylcarbamazine, each of 10 days with intervals of 10–20 days, and 5–10 weekly injections of suramin. Hutton (p. 391) reports a case of onchocercal dermatosis successfully treated with diethylcarbamazine and suramin.

In Guatemala Burch *et al.* (p. 1007) used suramin sodium in a population highly infected with *O. volvulus*, and report a spectacular reduction in incidence, but Burch (p. 1116) notes that the drug had only a toxic, and not a lethal, effect on *W. bancrofti*.

[It should perhaps be pointed out that some physicians hesitate to use suramin for onchocerciasis (for instance in European children) because of its possible toxic action on the kidney.]

In the Belgian Congo there are 6 important foci of onchocerciasis, and rates of infection up to 100 per cent., with blindness in up to 5 per cent., have been found in some riverine communities. Lebrun (p. 670) states that treatment with diethylcarbamazine and suramin is not feasible as a

reliable preventive measure, and that the Congo river is too big for dosage with DDT. A campaign of daily spraying of the riverside vegetation for 26 days in 1948, however, proved highly successful in killing adult *Simulium* and this was sufficient to break the transmission of *Onchocerca* so that the area has remained clear of new infections up to the time of writing. Garnham (p. 670) sums up the general trend of control, mentioning his own pioneer work in treating streams with DDT; other methods of control are the clearing of riverine bush as carried out by Buckley, and the systematic excision of nodules as practised in Mexico. In French West Africa the disease is widespread and control by entomological means has not been possible; Masseguin *et al.* (p. 670) give details of the treatment they adopt with diethylcarbamazine and suramin. Various speakers at the meeting at which these papers were read reported on control schemes.

For the control of *Simulium* species in Guatemala, where onchocerciasis is a problem, Lea and Dalmat (p. 1128) found that treatment of small and intermediate streams with DDT at a strength of 0·1 p.p.m. for 3 minutes, and of larger streams with 2·0 p.p.m. for 3 minutes or 0·1 p.p.m. for 60 minutes, would be valuable. EPN and heptachlor could also be used for the smaller streams.

### *Dracunculus medinensis Infection*

Onabamiro (p. 472) in Nigeria has observed that cyclops infected with *Dracunculus medinensis* tend to become sluggish and to fall to the bottom of ponds when the larvae have developed in them to the third (or infective) stage. He argues that in the rainy season when the ponds are full of water the cyclops are relatively dispersed and the chance that the people would be infected from drinking water is slight; in the dry season, however, the ponds are low and the cyclops are concentrated in the remaining water, and are likely to be in the infective state. It is in the dry season, therefore, that the disease is most readily spread. Di Egidio (p. 673) reports 2 foci of dracontiasis in Yemen.

### *Enterobius Infection*

*Enterobius* was found in 93 per cent. of children in institutions in Czechoslovakia by Glocman (p. 1008), in 44 per cent. of Ahmedabad schoolchildren by Modi and Dave (p. 1009) and in 6 per cent. of children in Puerto Rico by Malewitz and Lysenko (p. 1130). Other worms are also recorded in these series.

Bonelli (p. 1130) found *Enterobius* in 25 per cent. of 130 appendices removed from children. Elwi and El-Tiraei (p. 1009) make the interesting observation that the incidence of *Enterobius* in acutely inflamed appendices removed at operation was much less than in normal appendices, presumably because the suppurative process had destroyed the worms in the lumen of the appendix. In chronic appendicitis,

whether schistosomal or non-schistosomal, the incidence approached that in normal appendices.

Jelliffe and Sharpe (p. 812) treated children with *Enterobius* infection, using gentian violet, Diphenan, oxytetracycline or Benadryl. The results were not good and the authors conclude that there is at present no really effective treatment, though piperazine adipate has received favourable notice. They doubt whether treatment is necessary if marked symptoms such as severe pruritus or vulval irritation are absent. On the other hand, good results are reported by Allen (p. 674) with gentian violet suppositories together with the same drug by mouth, or Diphenan (*p*-benzylphenylcarbamate) or Antepar (a piperazine preparation) by mouth. Piperazine hydrate has received good notices, being used in doses of about 60 (or even up to 133) mgm. per kgm. daily (divided into two portions) for 7–10 days or for 2 courses of 7 days each, or for 14–21 days (Howie, p. 675; Amato Neto and Corrêa, p. 813; Ricci and Corbo, p. 1131).

Aparicio Garrido (p. 1216) used hydrate or citrate of piperazine in daily doses of 0·8 to 2·4 gm. for 2 courses of 7 days each for *Enterobius* infection and 2 to 3·3 gm. for 3 days for *Ascaris*, with good results. The citrate has been used in daily doses equivalent to 15–75 mgm. of the hexahydrate per kgm. for courses of 10 days, or of 2 periods of 7 days separated by a week, or of 14 days, by Brown and Chan (p. 920) and Rachelson and Ferguson (p. 921), who report good results.

Siemens (p. 1216) used piperazine adipate tablets for mass treatment with success, though some children would not take them, and also a pleasant fluid preparation of piperazine citrate, also with success.

A cure rate of 88 per cent. is reported by Goeters (p. 675) who used a piperazine preparation, Uvilon.

Rudat (p. 677) used a preparation containing BHC, with good results. The combination of tablets and suppositories seemed to be essential; the drug has a mouldy taste, but is relatively non-toxic.

Kendig and Arnold (p. 187) found oxytetracycline (5 mgm. per lb. per day for 1 week) effective in 72 per cent. of cases. A dosage of 10 mgm. per lb. per day for 3 days was much less successful.

Good results are reported by Chan and Brown (p. 814), with bacitracin and sulphasuxidine for 5–7 days.

Experiments on animals showed that tetracycline has a strong action on *Rhabditis*, *Syphacia* and *Aspiculuris* infections and Harant *et al.* (p. 1131) treated with it 3 patients suffering from *Enterobius* infection, with good results.

Friedrich (p. 69) comments on the toxicity of phenothiazine, quoting 2 cases of anaemia in children resulting from this drug. She warns particularly about the danger of overdosage if chocolate preparations are used, which have a pleasant taste; they should be given only on a medical prescription. Haase (p. 676) reports 10 cases of poisoning with a chocolate preparation of phenothiazine, in addition to a number of others

recorded by other workers, and he draws attention to the danger of such preparations.

### *Trichuris and Capillaria Infections*

Jung (p. 286) treats *Trichuris* infection by means of enemas of 0·8 gm. hexylresorcinol in 400 cc. of distilled water. This mixture may cause a second-degree burn of the buttocks if they are not covered with petroleum jelly, but it is claimed that it does not damage the mucosa of the gut. For a child aged 2–4 an enema of 500 cc. may be needed to reach the caecum; it should be retained for 30 minutes. In mixed infection with *Entamoeba histolytica* and *Trichuris*, with bloody diarrhoea, Garfinkel *et al.* (p. 366) found that anti-amoebic treatment was poor, but that anthelmintic treatment with enemata of 0·3 per cent. hexylresorcinol in 10 per cent. acacia was very effective.

A detailed description of a fully verified, and fatal, case of *Capillaria hepatica* infection in a young girl is given by Otto *et al.* (p. 1129).

### *Trichinella Infection*

An outbreak of trichiniasis due to consumption of pork sausage from garbage-fed hogs is reported by Freeman *et al.* (p. 678), and an epidemic due to eating uncooked dried pork is described from Serbia by Sretenović *et al.* (p. 1217). The incubation period was 6–20 days; all patients showed pyrexia, eosinophilia and conjunctivitis, and most had muscular and abdominal pain, swelling of the face, cough, and diarrhoea. Masterton and Lewis (p. 1217) found *Trichinella* larvae in muscle taken from dead sledge dogs used in an expedition in Greenland; they comment on the danger of eating undercooked meat there.

Tompkins and Muraschi (p. 1010) describe a procedure for the complement-fixation test in trichiniasis, which they state is highly specific.

As a result of experience in Chile, Luengo and Rodríguez (p. 474) conclude that for the detection of *Trichinella* in pigs the phototrichinoscope should be used as a routine, and 8 slides should be examined.

Boyd and Huston (p. 474) describe a study of the distribution, longevity and sex ratio of *T. spiralis* in hamsters after initial infection.

Zaiman and his colleagues (p. 566) have published a series of papers on the nature of immunity to *Trichinella spiralis* in pairs of rats, one individual in each pair being infected and the other not. Details should be sought in the originals.

In mice cortisone tends to break down immunity to re-infection with *Trichinella spiralis* (Stoner and Godwin, p. 71). *Charles Wilcocks*

## MALARIA

*In this section abstracts are arranged as far as possible in the following order*:—Human malaria—*epidemiology, aetiology, transmission, pathology, diagnosis, clinical findings, treatment, control;* Animal malaria—*monkeys, other animals, birds.*

GUNTHER, C. E. M. **The Problems of Malaria in New Guinea.** *Med. J. Australia.* 1956, Mar. 24, v. 1, No. 12, 493–8. [12 refs.]

New Guinea and its associated islands together make up an integral geographical unit, ethnologically homogeneous. Identical malaria problems exist throughout the whole area. Most of the area is mountainous, rugged and inaccessible; it has a heavy rainfall, and is covered by dense jungle. The indigenous population is 3,000,000; there are also 20,000 Europeans and 15,000 Asians, living mainly in the larger centres.

*Plasmodium falciparum*, *P. vivax* and *P. malariae* are everywhere present. *P. ovale* has been reported. There are two important vectors, *Anopheles punctulatus farauti* and *A. punctulatus punctulatus*. Both breed in still, shallow collections of water exposed to sunlight, even in footmarks. Every phase of human activity therefore tends to multiply breeding places. Control by larvicidal methods is considered impossible. In general, drug prophylaxis and protection from mosquitoes can be considered only for the European and Chinese populations. Nearly all the Chinese are indigenous, and they present the fewest malaria problems of all the population.

Non-tolerant New Guineans in non-endemic areas present a double problem. As any area is opened up, the sunlight-breeding mosquitoes move in and malaria starts. Invasion is fortunately slow. Prophylactics should not be given; the Medical Services act at the same time, and repeated treated attacks eventually give tolerance. Non-immunes who go down to seek work in endemic areas suffer severely, but nowadays they are followed up on their return home, and treated.

A detailed discussion of prophylactic drugs, their effectiveness and cheapness, ends strongly in favour of proguanil. But where *P. malariae* is present, the ideal prophylactic is considered to be 100 mgm. proguanil plus 150 mgm. quinine hydrochloride daily, combined into one tablet. Quinine is far more effective against *P. malariae*, as prophylactic or cure, than any other drug, and is considered to be efficient and useful, and carefully used, a safe drug. The native people of New Guinea do not suffer from blackwater fever.

Figures of malarial invalidism in a labour force of tolerant persons are given, and it is calculated that prophylaxis would cost more than did treatment of the little malaria that occurred, amounting to the loss of only 0·23 per cent. of the total possible man-days of work, and 8·9 per cent. of all sickness.

Widespread malaria control is possible only by residual spraying methods. Two possible catastrophes must be considered. First: through

" slovenly half-measures " the mosquito population may become resistant to the residual insecticides. Second: once such a programme has been started, it would be disastrous to break it off after reducing materially the present tolerance to malaria in the affected population. The expenditure of large sums of money for many years to come must be envisaged, with an inevitable absence of visible results for a long time. Some guarantee of continuance of funds, without interference by remote control (of which an instance from elsewhere is given), is needed to ensure success.

*B. B. Waddy*

Loddo, B., Zambelli, P. & Congiu, A. Specie anofeliche e reinvasione di territori disinfestati. [**The Re-invasion of Disinfested Areas of Sardinia by Species of** *Anopheles*] *Nuovi Ann. d'Igiene e Microbiol.* 1956, Mar.–Apr., v. 7, No. 2, 117–32, 1 graph & 5 maps. English summary.

Since the systematic, island-wide attack on anophelines by the organization ERLAAS [see this *Bulletin*, 1953, v. 50, 909] the main vector of malaria in Sardinia, *Anopheles maculipennis labranchiae*, has remained at a low level. The work of ERLAAS from 1946 to 1950 was mainly with DDT. Control measures on a smaller scale have continued and, since 1952, Paris green has been used as a larvicide.

The treated zones (in different parts of the island) were kept under careful observation each year, during and after the treatments and information was gradually collected on the rate of re-invasion of these zones by the species *Anopheles claviger*, *A. algeriensis*, *A. marteri* and *A. hispaniola*. Maps of certain areas are given, showing the extent of the treated areas and the degree of infestation of surrounding territory. The treated zone is marked with figures indicating the number of weeks, after control ceased, before the re-invasion of a particular species. Further data are given in tables showing the times of re-invasion of sectors at different distances from the infested periphery. As a result, the authors calculate that *A. claviger* invades at a rate of 0·7 to 0·96 km. per week; *A. algeriensis* at 1·13 km. per week and *A. hispaniola* is most rapid, travelling 3·43 (max. 11·0) km. per week. Altitude is of minor importance, since *A. claviger* readily invades low areas and *A. algeriensis* enters hilly areas; but invasion often follows the course of rivers.

*J. R. Busvine*

Abul-Hab, J. K. **Observations on the Overwintering of** *A. sacharovi* **(Anophelini, Culicidae) in Suleimaniya Liwa, Northern Iraq.** *Bull. Endem. Dis.* Baghdad. 1956, v. 1, No. 4, 298–310, 4 diagrams.

During the months of October to May in the years 1952–1955, the author made observations on the biological activity of *Anopheles sacharovi* in Suleimaniya Liwa, Northern Iraq. The collected data are summarized in this paper and show that overwintering females of this anopheline

exhibit similar behaviour to that of *A. m. atroparvus* in Western Europe. The three points of cold season activity discussed are, firstly, a tendency to congregate in houses; secondly a tendency to continue feeding and thus replenish fat-body, and thirdly, the incomplete suppression of ovarian development. This last is thought to be initiated by some cyclical factor and not entirely by changes of climate. In short, *A. sacharovi* does not undergo complete hibernation though biological activity is reduced.

The epidemiological implications of these findings have not been assessed though it is suspected that this anopheline does not transmit malaria in Northern Iraq during the period of partial hibernation. [See also Macan, this *Bulletin*, 1951, v. 48, 103.] *H. S. Leeson*

Misra, B. G. **Incrimination of Malaria Vector in North-East Frontier Agency.** [Research Notes.] *Bull. Nat. Soc. India for Malaria & other Mosquito-Borne Dis.* 1956, May, v. 4, No. 3, 91–2.

Of 52 mosquitoes of 6 species dissected, one specimen of *Anopheles minimus* was found infected.

Blanton, F. S. & Peyton, E. L. **Notes and Distribution Records of *Anopheles* and *Chagasia* Mosquitoes in Panama based on a Three Year Light Trap Survey.** *Mosquito News.* 1956, Mar., v. 16, No. 1, 22–6.

Light traps used were of either New Jersey or Shannon pattern. During operation 240,573 mosquitoes, 425,141 *Culicoides* and 39,023 *Phlebotomus* were captured as well as Tabanidae and Simuliidae. This is the first of a series of papers on the results of light trapping. The authors point out that many mosquitoes are diurnal, and sabethine mosquitoes and *Haemagogus* are not especially attracted to light. Out of 19 species of *Anopheles* collected in Panama 15 have been collected in the light traps. The species found infected in nature are *A. albimanus*, *A. albitarsus*, *A. aquasalis*, *A. argyritarsis*, *A. pseudopunctipennis*, *A. punctimacula*, *A. strodei* and *A. vestitipennis*. *A. albimanus* is believed to be the main vector of malaria although *A. punctimacula* may be important. These 2 species have the widest distribution. The distribution of each species is given in detail. *B. R. Laurence*

Sergent, Ed. La prémunition antipaludique et les accès de prémunis. [**Premunition in Malaria and the Response to Reinoculation**] *Arch. Inst. Pasteur d'Algérie.* 1955, Dec., v. 33, No. 4, 307–9.

This paper which originally appeared in the Grassi Centenary number of the *Riv. di Parassit.* gives a useful summary of the author's views today on premunition. He compares its effects particularly with those

of true sterilizing immunity as produced by smallpox or typhoid fever, and stresses the instability of the former which is so liable to be disturbed by lowering of resistance from whatever cause. In true immunity, the protective effect is achieved by the action of humoral antibodies; in premunition above all by phagocytosis. In premunition, the organism remains in the body, and while there, none other of the same species (or even of the same genus in the case of *Anaplasma*) can occupy the niche; once it has disappeared, however, reinvasion is possible. This is the basis of vaccination with a living (attenuated) organism, such as BCG, vaccination against brucellosis, etc.

A subject in a state of premunition against malaria, if reinoculated with the same strain of parasite will show either no parasitaemia at all or at most a transient infection. The latter is called the *accès de prémuni*.

*P. C. C. Garnham*

Charcosset, R. Un cas d'éruption cutanée due à l'absorption de " Flavoquine ". [**Skin Eruption due to the Absorption of Flavoquine (Amodiaquine)**] *Bull. Méd. de l'Afrique Occidentale Française*. 1955, v. 12, 33–4.

Leiker, D. L. **Note on Sulphone Activity in Malaria Infection.** *Leprosy Review*. 1956, Apr., v. 27, No. 2, 66–7.

The author, in Netherlands New Guinea, noted some years ago that 27 leprosy patients treated with DDS were free from malarial attacks for more than a year. They were living in a holoendemic area and *Anopheles punctulatus* were often found in the hospital area.

Only one attack of clinical malaria occurred among 164 inmates of one leprosarium during a year, and all blood films were negative. The single attack was in a newly-admitted patient.

The difference between the leprosy patients treated with DDS and the general population is so striking that the author inclines to the view that DDS has some suppressive effect on malaria. He points to the practical significance of this finding in countries where both diseases are endemic, especially in remote regions where there are no laboratory facilities. He also points out that the leprosy reaction may simulate clinical malaria in partly immune adults.

He found no such association with DDS treatment in the case of filariasis: microfilariae were found in 23 per cent. of night bloods from 133 inmates treated with DDS.

*H. J. O'D. Burke-Gaffney*

Farinaud, M. E. Lutte antipaludique et pulvérisations d'insecticides chlorés à effet rémanent en Afrique du Nord. [**Malaria Control and Residual Spraying in North Africa**] *Riv. di Malariologia*. 1955, Dec., v. 34, Nos. 4/6, 177–89. [13 refs.]

The imagicidal attack on malaria is used less extensively in North Africa than elsewhere despite its wide success in the Mediterranean region. The background lies in the long history of effective control in North Africa, largely under the influence of the SERGENT brothers, based on larvicidal control and prophylactic medication and which has caused a steady regression of the disease. Policy however deserves reconsideration. Full reference is made to the work of HOUEL in Morocco [this *Bulletin*, 1956, v. 53, 23] which shows that the present successful but conservative mechanism in Morocco might be beneficially replaced by a more extensive use of the imagicide. In Algeria control is based on larvicidal attack, principally with dieldrin granules distributed from aircraft. There is however experience with imagicides, 315,485 houses having been treated in a campaign from which much valuable data have been secured. It shows that full control can be secured if spraying is started sufficiently early in the season. There are difficulties in extension of imagicidal control. Some arise from memory of early failures due to mistaken techniques; psychological resistance from the population is important but can be overcome in large national programmes supported with sufficient publicity. The author concludes that success with old methods should be no bar to the extension of new ones which have proved themselves superior. *G. Macdonald*

MORIN, H. G. S. Sur la campagne antipalustre 1953–54 au Cameroun. Mesures préventives prises. (Premiers résultats enregistrés.) [**First Results of Malaria Control Measures in the French Cameroons in 1953–54**] *Riv. di Malariologia.* 1955, Dec., v. 34, Nos. 4/6, 191–213.

An anti-malarial campaign is described, with a wealth of detail about the climatic and social factors involved. The French Cameroons are divided into 3 parts, of which the northern has a very dry climate with a clear-cut rainy season. In this zone, imagicidal measures were clearly indicated, and when applied to a population of about 100,000 successfully reduced the infant parasite rate very nearly to zero. Malariological conditions in the middle and southern zones are similar; both are afforested, and have poor communications away from the main roads. Epidemiological and entomological findings varied between districts; often it was not easy to catch enough anophelines even to identify the local vector. Generally, the more the natural forest had been interfered with by human activities, the higher was the malarial index, probably on account of the encouragement of *Anopheles gambiae*. *A. nili* and *A. moucheti* are other species which have been incriminated locally as vectors.

In the middle zone, a pilot anti-malarial project was carried out on a population of about 48,000 centred on Yaoundé. Five different spraying methods were tried. BHC proved to be the least effective insecticide; in a country with poor communications its brief residual effect was too

great a disadvantage. Dieldrin was used only on a small scale, and insufficient evidence was accumulated on which to judge it. A method of selective spraying, based on the finding that mosquitoes rarely rest below a height of 2½ metres above ground level, was as successful as complete spraying. It is concluded that for first spraying with DDT, the dose should be 2 gm. of *para para* isomer per square metre, but that for respraying 2 gm. of technical DDT per square metre are adequate.

The results of the pilot project were considered to be satisfactory, with the reservation that another 2 to 3 years are needed in which to assess them fully. Parasite rates were lowered from 18 to 12 per cent. in treated villages, while they remained constant in untreated villages. [This may not appear to indicate any very spectacular success, but the author is throughout very cautious in his claims, which therefore have the more validity.] *B. B. Waddy*

Rafi, S. M. & Rashid, A. **Residual Insecticidal Spraying in Sheikhupura District of the Punjab from 1951–1954 and its Results.** *Pakistan J. of Health.* 1955, July, v. 5, No. 2, 88–95, 6 graphs & 1 map.

The senior author has outlined a scheme of malaria control in western Pakistan and given 2 progress reports on it [this *Bulletin*, 1953, v. 50, 1012; *ibid.*, 1954, v. 51, 768; *ibid.*, 1955, v. 52, 610]. The major scheme includes villages in 16 of the 18 districts in the Punjab. The story is here elaborated in relation to one district, Sheikhupura, and for a further year, 1954. The programme is as previously described. Data are given on spleen and parasite rates, the parasite rate in infants, malaria morbidity, and on adult and larval vector prevalence. The spleen and parasite rates show a slow decline. The infant parasite rate in sprayed villages is zero but the numbers examined are not stated. Morbidity has declined. There is a decline in the number of adult mosquitoes, as might be expected, and also a considerable reduction in larval prevalence.
*G. Macdonald*

Black, R. H. **The Present Status of Malaria Control in the South-West Pacific Area.** *Med. J. Australia.* 1956, Mar. 24, v. 1, No. 12, 498–501, 6 figs.

The area under discussion consists of Netherlands New Guinea, the Territory of Papua and New Guinea under Australian control, the British Solomon Islands Protectorate, and the Condominium of the New Hebrides controlled jointly by France and Great Britain. In this area, until recently, there has been no effective rural malaria control. Urban malaria has been controlled on several occasions with reasonable success, mainly by larval control measures. Larval control measures are not practical in rural areas, and the local population does not cooperate in the regular

taking of suppressive drugs, *e.g.*, in an experiment tried in 1952 and 1953. Larval control by oiling, with or without the addition of DDT, has been successful in Netherlands New Guinea, but only in areas where close supervision of the work is possible.

Delay in initiating residual spraying campaigns in the South-West Pacific area has been due to doubts about the resting habits of the local vectors, *Anopheles* of the *punctulatus* group. It is now established that these mosquitoes do rest indoors at night, dawn apparently providing a stimulus for leaving the house. After some encouraging experiments in the use of DDT and dieldrin, a pilot project, with the use of wettable DDT powder as a residual spray, was commenced in the Lake Sentani area near Hollandia in 1954 [this *Bulletin*, 1956, v. 53, 153, 154]. The project covered about 6,000 people; latest reports indicate practically complete cessation of malaria transmission in the area, which is now being extended.

A national malaria campaign must be planned so that it is carried out efficiently and as rapidly as possible, transmission being halted for a sufficient period throughout the country to allow interruption of spraying before resistance has developed in the anopheline vectors. Spraying does not have to be continued indefinitely; once its full effect has been achieved it is stopped, and the area policed to detect recrudescences.

In Netherlands New Guinea and the Territory of Papua and New Guinea full-size campaigns are possible. In the British Solomon Islands the population is only 100,000 and in the New Hebrides about 50,000; in these two countries malaria control programmes would be comparatively expensive. In all the countries of the area difficulties in communications increase the *per caput* cost of the campaign but do not make it impossible. A malaria school at Minj in the Western Highlands has been in operation since 1955. It is likely that dieldrin will be the residual insecticide used in the programme. It is hoped that in the next few years there will be considerable progress towards the goal of malaria eradication.

*B. B. Waddy*

Montalván C., J. A. Informe de labores del Servicio Nacional Antimalárico durante el periodo de Julio 1° de 1954 a Junio 30 de 1955. [**Report on the Work of the National Anti-Malaria Service from July 1, 1954—June 30, 1955**] *Rev. Ecuatoriana de Hig. y Med. Trop.* Guayaquil. 1955, Apr.–June, v. 12, No. 2, 15–83, 1 chart.

The previous annual report on the activities of the National Antimalaria Service of Ecuador [this *Bulletin*, 1956, v. 53, 29], whose aim was the complete eradication of malaria from that country, expressed forebodings of insufficient financial support for the prosecution of an effective campaign in 1954–55. The present report shows that those fears were justified. The work has had to be curtailed, but the very numerous

tables that detail the work accomplished give no indication of any catastrophic increase of malaria prevalence. The author is justified in emphasizing that any premature slackening of effort might result in the development of DDT resistance on the part of the anopheline vectors. Meanwhile financial stringency continues. Guayaquil and other important centres of population remain completely free from locally acquired malaria. *Norman White*

Ferreira, M. O. & Azambuja, C. E. A. Nota sôbre uma possível modificacâo de hábitos de anofelinos do sub-gênero *Kerteszia* em zona submetida a dedetizações domiciliárias. [**Possible Change of Habits of *Kerteszia* Mosquitoes in an Area Subjected to Domiciliary Spraying with DDT**] *Rev. Brasileira Malariologia.* Rio de Janeiro. 1955, July, v. 7, No. 3, 367–9. English summary (8 lines).

As part of an anti-malarial campaign in Brazil, intensive domiciliary spraying with DDT was carried out in certain areas in an attempt to reduce or eliminate anopheline mosquitoes of the sub-genus *Kerteszia*; the species involved were the known vectors *A.* (*K.*) *cruzii* and *A.* (*K.*) *bellator*, and a third possible vector, *A.* (*K.*) *homunculus*. Spraying was carried out once a year on the inside walls of houses, at 2 gm. of DDT per square metre of surface area.

Subsequent to this insecticide application, numerous visits were made between January and August of one year to one of the treated localities, and anophelines captured from both inside and outside walls of the houses. In all, 306 *Kerteszia* were obtained from 1,644 inside walls (an average of 0·2 specimens per wall), and 754 from 1,314 outside walls (average 0·6). By comparison, collections made in an untreated locality yielded 1,212 *Kerteszia* from 363 inside walls (average 3·33), and 5 from 326 outside walls (average 0·02).

It is suggested that the differences in site of capture of the mosquitoes may be due to residual effects of the DDT, or alternatively to a change in the habits of the anophelines, correlated with insecticide spraying. *N. R. Phillips*

Fulton, J. D. & Grant, P. T. **The Sulphur Requirements of the Erythrocytic Form of** *Plasmodium knowlesi*. *Biochem. J.* 1956, June, v. 63, No. 2, 274–82, 1 fig. [33 refs.]

The sulphur metabolism of *Plasmodium knowlesi* was studied by means of radio-active $^{35}S$. Erythrocytes were labelled with $^{35}S$ by injecting [$^{35}S$] methionine intravenously into a suitable monkey; 8 days later blood was removed from this animal and transfused into a monkey infected with *P. knowlesi*. The parasites from the latter monkey were later isolated and examined, and it was shown that 80 per cent. of the

methionine in the protein of the parasite is derived from that in the globin of the red cell; 20 per cent. of the parasite's supply of methionine is presumably derived from free amino-acid in the plasma. Much of the methionine in globin seems not to be available to the parasite.

As regards cystine, perhaps 30 per cent. of the parasite's cystine is derived from globin; 50 per cent. of the parasite's cystine could be derived from the glutathione of the erythrocyte but it is not known whether this does in fact happen. Free cysteine in the plasma is converted by the parasite into cystine only to a small extent. *P. knowlesi* is able *in vitro* to convert [$^{35}$S] methionine into [$^{35}$S] cystine and this provides a further source of cystine sulphur for the parasite in addition to that already present in the haemoglobin and glutathione of the erythrocyte. This may account for 20 per cent. of the parasite's cystine.

[This paper reports much careful biochemical work and the original should be consulted by those interested.] *F. Hawking*

Ray, A. P. **Role of Vitamin $B_{12}$ in Liver Injury.** [Research Note.] *Bull. Nat. Soc. India for Malaria & other Mosquito-Borne Dis.* 1956, Jan., v. 4, No. 1, 21–2.

The author has already shown that fatty changes occur in the liver of monkeys on a low-fat, low-protein diet within 4 to 6 weeks if they are inoculated with simian plasmodia. Since some workers claim that vitamin B12 has some lipotropic properties, the author gave 5 μgm./kgm. of crystalline vitamin B12 intramuscularly daily, or on alternate days, to 3 monkeys on such a diet which were inoculated heavily with *Plasmodium cynomolgi*. After 2 weeks no improvement in the livers of the monkeys could be found in biopsies. Evidently the vitamin showed no lipotropic effect in the conditions of the experiment and it is presumed that other factors are concerned. *H. J. O'D. Burke-Gaffney*

Fulton, J. D. & Spooner, D. F. **The *in vitro* Respiratory Metabolism of Erythrocytic Forms of *Plasmodium berghei*.** *Exper. Parasit.* New York. 1956, Jan., v. 5, No. 1, 59–78, 2 pls. & 5 figs. [35 refs.]

Parasitized red blood cells from rats infected with *P. berghei* were concentrated by the method of Ferrebee and Geiman [this *Bulletin*, 1947, v. 44, 17].

The separated parasitized cells were studied in the Warburg apparatus and comparisons were made between their metabolism and that of normal reticulocytes.

Oxygen uptake, utilization of glucose and production of lactic acid were greater in parasitized cells than in reticulocytes, but the degree of inhibition with enzyme inhibitors and of formation of metabolic products, formic, acetic, succinic, pyruvic and α-oxo-glutaric acids (identified by

gas phase and paper chromatography) was similar in parasitized cells and normal reticulocytes. *W. E. Ormerod*

Singer, I. & Trager, W. **Coenzyme A Changes in Liver, Spleen and Kidney of Rats with Infections of** *Plasmodium berghei*. *Proc. Soc. Exper. Biol. & Med.* 1956, Feb., v. 91, No. 2, 315–18.

Earlier work by Trager has shown the importance of coenzyme A to the malaria parasite *Plasmodium lophurae* [this *Bulletin*, 1953, v. 50. 195; 1955, v. 52, 255]. The depletion of the coenzyme in the livers of infected chicks appeared to be correlated with its appearance in the parasites. The present investigation deals with an attempt to find whether the same conditions hold in rats infected with *P. berghei*. For this purpose 2 groups of 15 rats of weight about 50 and 200 gm. respectively were infected intravenously by blood inoculation with *P. berghei* and a similar number of corresponding weight served as controls (60 rats in all). Animals from control and experimental groups were killed at 4-day intervals and after exsanguination spleen, liver and kidneys were removed and weighed and stored at −25°C. till required. Coenzyme A was estimated by microbiological methods as described in the earlier work.

During the course of infection the coenzyme concentration of the liver dropped while the size increased so that the total amount present was unaltered. In the spleen the concentration remained unaltered and the total amount present was increased. The changes in the kidney were negligible although the amount of free pantothenate with which the enzyme is associated was decreased in young animals during infection.

The authors are of the opinion that formation of coenzyme A by the infected host is concerned with innate immunity, and the ability to form this substance may determine survival. *J. D. Fulton*

Sergent, E. Observations d'infection latente d'emblée, avec prémunition corrélative, dans le paludisme expérimental à *Plasmodium berghei* du rat blanc. [**Observations on Latent Malaria, correlated with Premunition, in Rats infected with** *Plasmodium berghei*] Reprinted from *C.R. Acad. Sci.* 1954, Aug. 18, v. 239, No. 7, 524–5.

In an experimental study of *Plasmodium berghei* the author found that the course of infection in adult rats differed according to the route of inoculation. Thus, intraperitoneal inoculation invariably produced an acute attack with 5–10 per cent. mortality, whereas after subcutaneous inoculation the attack occurred only in 87 per cent. of cases. The remaining rats (13 per cent.) were refractory to the 1st inoculation. but the majority could be infected after subsequent re-inoculations. However, a minority of cases in this group remained completely resistant

to infection, and revealed no parasites in the course of prolonged examinations of the blood. In order to determine whether this resistance represented innate sterilizing immunity, the blood and fragments of organs of such rats were inoculated intraperitoneally into mice and rats respectively, with the result that acute infections were produced in the recipients.

From these observations it is concluded that the resistance to infection in the rats in question was due not to innate immunity, but to premunition acquired as the result of a latent infection which established itself in the rats inoculated subcutaneously. *C. A. Hoare*

Sergent, Ed. & Poncet, Alice. Étude expérimentale du paludisme des rongeurs à *Plasmodium berghei*. III. Résistance innée. [**An Experimental Study of** *Plasmodium berghei* **Malaria in Rodents. III. Innate Resistance**] *Arch. Inst. Pasteur d'Algérie*. 1955, Dec., v. 33, No. 4, 287–306, 5 graphs.

First the authors show that the canary is absolutely resistant to *Plasmodium berghei*, though birds inoculated with the parasite were subsequently found to be susceptible to *P. relictum*.

Four kinds of rodent were then tested—white mice, white rats, guinea-pigs and merions; and adult animals were used in all the experiments. Large numbers of parasites were given, although as few as 13 were found to be capable of infecting mice (there is an interesting table showing how progressive dilution of the inoculum to this figure causes a corresponding prolongation of the incubation period). In 6 years 1,577 adult white mice were infected with the K173 strain of the parasite, always with fatal results. On the contrary, guineapigs entirely failed to become infected, although parasites remained alive in the body of this animal for 2 days. Merions occupied an intermediate position: they exhibited very mild infections, which however could be detected by inoculation of large quantities of blood as long as 11 months after the original infection.

The experiments with white rats were the most interesting: 637 were inoculated and 18 per cent. suffered a fatal or very severe infection, 65 per cent. an average attack and 10 per cent. a feeble attack. The remaining 7 per cent. failed to become infected; 13 of these were killed a month after inoculation and their blood and organs were inoculated into white mice, none of which became infected; 20 more were exposed to up to 6 reinoculations of large doses of the parasite and here, surprisingly enough, 18 eventually responded, one developed a latent infection (only detectable by inoculations of its blood) and a single one showed an absolute innate resistance. The 18 mice whose immunity finally broke down exhibited mild attacks. Repeated exposure to infection, instead of immunizing the rats, seems finally to have sensitized them. [For Parts I and II, see this *Bulletin*, 1956, v. 53, 405, 717.] *P. C. C. Garnham*

Raffaele, G. Alcune osservazioni sulla vitalità degli sporozoiti. [**Observations on the Vitality of Sporozoites**] *Riv. di Malariologia.* 1955, Dec., v. 34, Nos. 4/6, 215–26. [23 refs.] English summary.

It is known that the sporozoites of malaria parasites, when inoculated by the mosquito, enter the blood stream, where they remain up to 30 minutes, after which they find their way into tissue elements where their exo-erythrocytic (EE) development takes place. Until the EE merozoites invade the circulation, there is a variable negative period during which the blood is not infective.

In his previous papers on avian *Plasmodium* the author suggested that in the blood the sporozoites are taken up by phagocytes, in which they start developing before invading cells of the reticulo-endothelial system, where the EE development is completed. Since it is thought that the sporozoites of human and simian parasites develop entirely in the parenchyma cells of the liver, it would seem that the type of host-cell varies according to the species of *Plasmodium* and that the corresponding sporozoites are capable of selecting the host-cell most suitable for their development. In that case one would expect the phagocytes in the blood to take up only the sporozoites of those parasites which are capable of developing in them, whereas the sporozoites of primate parasites are not affected by the phagocytes but proceed directly to the liver.

However, the author doubts the correctness of this view, and raises the question regarding the fate of sporozoites inoculated into the blood of hosts not adapted to their development. In order to study this problem, sporozoites of *Plasmodium gallinaceum* (in each case from salivary glands of 10 infected mosquitoes) were inoculated intravenously into canaries, rats and chicks (controls), whose blood was subinoculated at intervals into healthy chicks, in order to determine the viability of the sporozoites in the donors. It was found that the sporozoites remained infective up to 30 minutes in canaries and up to 105 minutes in rats, while in chicks they usually survived up to 60 minutes. It is concluded that the sporozoites are not damaged by the plasma, but may remain in the blood for a certain period, the length of which does not depend on the species of host or its susceptibility to infection. In both cases the sporozoites—like any foreign bodies—are engulfed by the phagocytes, in which their fate is decided: they either develop in them or are destroyed.

If it is true that the sporozoites of primate parasites penetrate directly into the liver cells, it must be assumed that they are capable not only of escaping the action of phagocytes but also of selecting the type of host-cell suitable for their development, *i.e.*, they are endowed with special tropisms enabling them to orientate themselves in the hostal organism. The author finds it difficult to admit that the primate parasites possess properties of which the avian parasites are deprived.

*C. A. Hoare*

Bishop, Ann & McConnachie, Elspeth W. **A Study of the Factors affecting the Emergence of the Gametocytes of** *Plasmodium gallinaceum* **from the Erythrocytes and the Exflagellation of the Male Gametocytes.** *Parasitology.* 1956, May, v. 46, Nos. 1/2, 192–215. [16 refs.]

The present investigation deals with an attempt to decide the factors which are responsible for emergence of gametocytes from red cells and the exflagellation of male gametocytes. The infections with *P. gallinaceum* were maintained in chicks by sporozoites injected by syringe or through the bites of infected mosquitoes. When very heavy infections were required blood passage was also used. In studying the action of $CO_2$ on gametocytes different concentrations of this gas were used, ranging from 100 per cent. to 5 per cent. mixtures in $O_2$ or $N_2$. After exposure to an atmosphere composed wholly of $CO_2$ no exflagellation was seen in drawn blood, even after re-exposure to air. After exposure to the lower concentrations of $CO_2$ emergence and exflagellation of male gametocytes took place only after return to an atmosphere of air. This inhibitory effect of $CO_2$ agreed with the observations of earlier workers [this *Bulletin*, 1932, v. 29, 817]. In blood exposed to pure nitrogen exflagellation occurred as in air, showing that $O_2$ was not necessary for development of gametocytes.

The effect of *p*H changes in blood was also studied in this connexion. After withdrawal of blood samples from the jugular vein of a heparinized chick the *p*H values were measured at intervals over a period of 20 minutes, during which time the *p*H value of both normal and infected blood gradually rose. The time of emergence and exflagellation of gametocytes was not correlated with *p*H values or with temperature. When the *p*H of blood was controlled by Tris buffer (hydroxymethylaminomethane) between *p*H 7 and 9, in which the parasites retained their normal appearance, development of gametocytes then occurred as in control samples of blood. Lowering of *p*H by means of this buffer, brought to the required value by N/10 HCl, partially inhibited gametocyte development. The effect of low *p*H was not always abolished when the value was brought back to the normal physiological range. From experiment with washed cells it was concluded that plasma played a part in gametocyte development. When the enzyme carbonic anhydrase, which plays a part in $CO_2$ transport in the blood, was inhibited by a sulphonamide (Diamox) and the *p*H of blood thereby lowered, it provided further evidence that factors other than *p*H controlled gametocyte development.

Dilution of blood did not appear to play a significant part. Micks *et al.* [*ibid.*, 1949, v. 46, 335] believed that there was a chemical factor in the secretions present in mosquitoes' stomachs which affected exflagellation, whereby fertilization was stimulated. The results by the present authors have not confirmed this, or that salivary gland secretions exercise an influence on development. They believe that a factor or factors may

be present in plasma which is activated possibly by diffusion of $CO_2$ from blood when drawn. *J. D. Fulton*

Carrescia, P. M. & Lioy, F. Anemie da infezione da *Plasmodium gallinaceum* nei polli. [**Anaemia in Fowls infected with** *Plasmodium gallinaceum*] *Riv. di Malariologia.* 1955, Dec., v. 34, Nos. 4/6, 241–57, 11 graphs. [11 refs.] English summary (5 lines).

This paper is devoted to a study of anaemia developing in fowls in the course of infection with *Plasmodium gallinaceum*. In adult birds, inoculated with infected blood or sporozoites, blood was collected every 24 hours for the examination of stained films, enumeration of erythrocytes and estimation of haemoglobin values. The results for the 15 birds are given in tables and graphs.

All the birds became infected, with an incubation period of 2–6 days in blood-induced infections and 6 days in those induced by sporozoites. The height of parasitaemia was reached in 5–10 and 10–11 days in the two groups respectively, while the primary attack lasted 10–15 days. In all cases there was a fall in the number of red blood corpuscles, from 2,020,000–2,800,000 per cmm. (normal) to 1,240,000–540,000. The haemoglobin content was reduced from 10·1–14·4 gm. per 100 cc. blood to 1·9–5·2 gm. The mean corpuscular haemoglobin (normal = 40–53 $\gamma\gamma$) remained normal in some birds, whereas in others there was hypochromia (20 $\gamma\gamma$).

The changes in the blood and the parasite rates in the experimental fowls have been plotted in curves, which show that the progress of anaemia was in direct proportion to the rise in parasitaemia, while an analysis of the data revealed no extra-parasitic factors which would account for the anaemia. *C. A. Hoare*

Bishop, Ann. **Absence of Potentiation between Quinine and Pyrimethamine in Infections of** *Plasmodium gallinaceum* **in Chicks.** *Parasitology.* 1956, May, v. 46, Nos. 1/2, 220–23. [15 refs.]

Ray *et al.* (*Indian J. Malariology*, 1953, v. 7, 311) found there was a high degree of potentiation between pyrimethamine and quinine in *P. gallinaceum* infection of chicks. Jaswant Singh *et al.* (*ibid.*, 1953, v. 7, 319) noted a similar phenomenon in the treatment of *P. falciparum* infections. The combined effect of these drugs has now been studied in *P. gallinaceum* infection in chicks. The birds of weight 45–60 gm. were inoculated intravenously with 50 million parasites, and dosed orally by catheter tube immediately after injection, as well as twice daily during the 3 following days, on the basis of body weight. The activity of the drugs was assessed by comparing the number of parasites per 500 red

cells in control and treated birds on the morning of the fourth day after inoculation. The author could not detect any potentiation of the action of either drug by the other. *J. D. Fulton*

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## TRYPANOSOMIASIS

*In this section abstracts are arranged as far as possible in the following order:—*African*—human, animal;* American*—Chagas's disease and other trypanosome infections. In each form the following order is followed:—epidemiology, aetiology, transmission, pathology, diagnosis, clinical findings, treatment, control.*

Trincão, C., Nogueira, A. A. R. & Almeida Franco, T. Quelques essais sur l'activité thérapeutique de la stilomycine (ex " achromycine " et " puromycine ") dans la trypanosomiase expérimentale chez la souris (*T. gambiense* et *rhodesiense*). [**The Therapeutic Activity of Stilomycin in Experimental Trypanosomiasis of Mice**] *C.R. Soc. Biol.* 1955, Oct, v. 149, Nos. 19/20, 1815–17.

Stilomycin is an antibiotic isolated from *Streptomyces albo-niger* at the Lederle laboratories in 1952 and reported to be active against trypanosomes as well as certain bacteria. The present investigation was undertaken to determine the effect of Stilomycin in the prevention and treatment of experimental trypanosomiasis.

In the first experiment mice were given a single dose [? route] of 100–500 mgm./kgm. 24 hours before inoculation with *T. rhodesiense*. In mice given 100 or 150 mgm./kgm. trypanosomes were found in the blood on the third day to the same extent as in control animals. In those given 200 to 250 mgm./kgm. trypanosomes were not seen till the sixth day. Higher doses caused death of the mice in 4 to 6 days. Injection of 100 mgm./kgm. Stilomycin on two consecutive days before infection did not prevent the appearance of trypanosomes in the blood.

Treatment of infection was more satisfactory. Two lots of mice infected with *T. rhodesiense* were given 20 mgm./kgm. daily for 10 to 12 days, starting on the day of infection. In each group [number not stated] all but one animal were cured of infection. Animals infected with *T. gambiense* and similarly treated were also cured in one experiment, although in another series apparent cure was followed by relapse.

In two lots of mice infected respectively with *T. rhodesiense* and *T. gambiense* and treated for a similar period with 30 mgm./kgm., parasites were never found in the blood stream. Doses of 60 mgm./kgm. were similarly effective.

A single dose of 20 mgm./kgm. administered the day after infection was without any therapeutic effect. When treatment was delayed until the fifth day of infection treatment for 10 days with this dose caused only

a temporary suppression of trypanosomes, and when treatment was delayed for a fortnight even a dose of 75 mgm./kgm. daily did not lead to permanent cure. *Mary Barber*

HERRER, A.; MORALES, J.; DÍAZ, J. Trypanosomiasis americana en el Perú. [**Studies on Chagas's Disease in Peru**] I. El insector vector y los animales que actúan de reservorio de la enfermedad de Chagas en la región sudoccidental [HERRER]. *Rev. Med. Exper.* Lima. 1952–1955, v. 9, 23–37, 1 folding map. [11 refs.] English summary. II. Repercusión del uso del DDT en la incidencia de la enfermedad de Chagas en algunos valles de la región sudoccidental. [HERRER]. *Ibid.*, 38–43, 1 fig. on pl. English summary (9 lines). III. Importancia del cobayo como reservorio de la enfermedad de Chagas en la región sudoccidental [HERRER]. *Ibid.*, 45–55, 3 figs. on pl. English summary. IV. Ingreso del *Triatoma infestans* al territorio peruano, su dispersión en éste y posibilidades de ser erradicado [HERRER]. *Ibid.*, 57–67, 2 figs. on pl. English summary (7 lines). V. Triatominos del valle interandino del Marañón [HERRER]. *Ibid.*, 69–81, 1 map & 6 figs. on 2 pls. English summary. VI. Verificación de la enfermedad de Chagas en la cuenca del Marañón [HERRER & MORALES]. *Ibid.*, 83–91. English summary. VII. Cepas del *Trypanosoma cruzi* de escasa virulencia [HERRER & DÍAZ]. *Ibid.*, 92–101, 4 figs. on pl. & 1 chart. English summary.

This comprehensive series of papers describes an investigation into the epidemiology of Chagas's disease in two parts of Peru. In the south-western region, *Triatoma infestans* is the only vector; this species was apparently introduced, and now occurs extensively, along the western slopes of the Andes. In the River Marañón basin, in the north-west of the country, an entomological survey disclosed the presence of 4 species of Triatominae, *viz. T. carrioni*, *Panstrongylus chinai*, *P. herreri* and *Belminus peruvianus*; of these, *T. carrioni* and *P. chinai* were scarce, the latter being rural in distribution.

In the south-west, the proportion of human dwellings harbouring *T. infestans* was usually between 10 and 20 per cent., but in one locality was 39·3 per cent. In a large area treated with DDT as an anti-malarial measure, the incidence of both *T. infestans* and of human infection was reduced.

Mean indices of infection of *T. infestans* with *T. cruzi* varied, according to situation and associated domestic animals, between 4·5 per cent. and 50·9 per cent. In human habitations (mean 19·3 per cent.), infected *T. infestans* were frequently encountered; the highest index of infection for a single locality was 57·1 per cent. A distinct correlation was noted between high infection indices and the rearing of guineapigs in or

adjoining human dwellings; it is suggested that guineapigs are important as (1) a source of food for *T. infestans*, thereby increasing the incidence of that species, (2) a reservoir of *T. cruzi*, causing an increased infection index, (3) a means of disseminating *T. cruzi* to other areas through transportation of the infected animals.

An examination of the blood of various domestic animals revealed natural infections in 17 of 297 guineapigs, and in 1 of 8 cats; in one locality 9 of 26 guineapigs (34·6 per cent.) were infected. No infections were found in dogs, rabbits or pigs. A natural infection of wild grey rats, together with *T. infestans* associated with them, was also determined, but nearby dwellings were not infested.

In the River Marañón region, xenodiagnosis indicated Chagas's disease in 22 of 338 persons (6·5 per cent.), while direct blood examination was positive in 3 of 292 of these persons (1·0 per cent.). Of the positive xenodiagnoses, 15 were in males and 7 in females; ages varied between 5 and 49 years, and all but 5 of the positive xenodiagnoses were in persons under 20 years of age. The index of infection of *P. herreri* in the Marañón region varied up to 83·3 per cent. in different localities, with a mean of 45·2 per cent.

Strains of *T. cruzi* from vectors used in the Marañón xenodiagnoses, and from natural infections in *P. herreri*, were of low virulence and short parasitaemia duration for experimentally infected rats, the infection rate decreasing from 81·5 per cent. in animals 1–10 days old, to 50·0 per cent. in rats 21 to 32 days old. In contrast, the strain of *T. cruzi* derived from the south-western region (" Costa " strain) had a high virulence for rats, the infection rate being 100 per cent. in animals of all ages from 1 to 32 days. Neither strain, however, was fatal to laboratory rats.

*N. R. Phillips*

Porto, C. Gastropatia chagásica crônica—Nota prévia. [**Chronic Gastric Involvement in Chagas's Disease; Preliminary Communication**] *Rev. Goiana de Med.* 1955, July–Aug.–Sept., v. 1, No. 1, 43–54. [139 refs.]

The English summary appended to the paper is as follows:—

" The author, in a preliminary report, advances the hypothesis that the stomach is involved in Chagas's disease. In support of this, he cites 23 patients with complement-fixation test (Machado Guerreiro's test) positive and gastric troubles for which no other etiology could be demonstrated. Among these patients four had normal electrocardiograms."

## LEISHMANIASIS

*In this section abstracts are arranged as far as possible in the following order:—visceral, cutaneous, muco-cutaneous.*

Corradetti, A., Saccà, G. & Neri, I. Studi epidemiologici sul kala azar nel promontorio Garganico (Puglie, Provincia di Foggia). [**Epidemiological Studies on Kala Azar in the Gargano Promontory, Puglia, Italy**] *Riv. di Parassit.* Rome. 1956, Jan., v. 17, No. 1, 5–10, 1 fig. English summary (9 lines).

The English summary appended to this paper is as follows:—

"The authors report the existence of a Kala Azar focus in the Gargano promontory (Adriatic Coast, Puglie, Province of Foggia). 97 cases of Kala Azar have been reported from 1930 to 1953. Visceral leishmaniasis is present in dogs as well. The vector of Kala Azar in Italy, *Ph. perniciosus* prevails in the zone, and it is especially found in houses. Other species present are: *Ph. major*, *Ph. minutus*, *Ph. papatasi*, *Ph. mascitti*. It is interesting to note that neither cases of oriental sore nor specimens of *Ph. perfiliewi* have been found in this zone, while in the adjacent northern coastal zone (Abruzzi) both the cutaneous disease as well as *Ph. perfiliewi* are present in great number."

Delon, J. & Dejeanne, G. Un cas marocain de "kala-azar". [**A Case of Kala Azar in Morocco**] *Maroc. Méd.* 1956, Mar., v. 35, No. 370, 253–5.

Kala azar has rarely been reported in Morocco.

Pringle, G. **Kala Azar in Iraq: Preliminary Epidemiological Considerations.** *Bull. Endem. Dis.* Baghdad. 1956, Jan., v. 1, No. 4, 275–94, 1 map. [24 refs.]

Since 1953 a small number of cases of kala azar have occurred in Iraq. A northern focus was described in 1954 [this *Bulletin*, 1955, v. 52, 260] but since then no further cases have been reported from that area. In the same year another focus was revealed in Central Iraq, from where 16 proved and 2 suspected cases have been reported up to October 1955. The localities in Central Iraq are shown on a map and the epidemiological data are summarized in a table.

It has not been possible to demonstrate an association between the human cases and infestation in domestic dogs, but jackals appear to possess many of the necessary qualifications. At any rate their earths provide a suitable environment for sandflies and greater numbers concentrate in them than in the smaller burrows of wild rodents.

From crevices in walls, hollow trees and squirrel burrows in the

Zagros mountains the following species of *Phlebotomus* were collected:— *papatasi*, *sintoni*, *baghdadis*, *sergenti*, *dentata mediensis* and *wenyoni*; 2 forms, *kandelakii* and *chinensis* var., were recorded for the first time from Iraq. As potential vectors of kala azar occur in the area and in view of the proximity of the foci it is surprising that only one proved case has so far been reported from this region; this is perhaps due to the poor standard of diagnosis.

From burrows and buildings in the plains of Central Iraq, *papatasi*, *baghdadis* and *sintoni* were taken; *sergenti* and *alexandri* were comparatively rare; and *clydei* was taken for the first time in Iraq in burrow collections from 3 localities. Other species from the plains were *palestinensis*, *theodori babylonica* and a new species near *theodori*.

In a collection made in a garden in Baghdad all the species from the Central plain were represented except *clydei* and the new form of *theodori*; the most prevalent species however was *squamipleuris*. On 4 occasions a total of 206 sandflies were collected from the arms of the author; all these were *papatasi*.

*Phlebotomus sergenti* is the sandfly associated with the more densely populated quarters of Baghdad and Mosul, and the water-logged sectors of the high level canal system. But these cases originated in peri-urban localities and in dry, less intensely irrigated tracts of the plain, a distribution which suggests that *sergenti* is not the vector of kala azar here; moreover *alexandri* and *clydei* are rare; and sandflies of the "major" or "chinensis" group are absent; therefore suspicion must be directed towards *papatasi* as the most likely species to be the vector of kala azar in the plains of Central Iraq. Further work is needed.— *H. S. Leeson*

Lizarraga, J. & Gulacsy, Z. Seis casos de Kala-Azar infantil en el pabellon de niños "Luisa Caceres de Arismendi" de Valencia. [**Six Cases of Infantile Kala Azar in a Childrens Clinic (Luisa Caceres de Arismendi) in Valencia (Venezuela)**] *Jornadas Nacionales de Puericult. y Pediatr.* Valencia. 1955, Mar. 2–6, v. 2, 693–711.

Chang, Patricia C. H. **The Ultrastructure of** *Leishmania donovani*. *J. Parasitology*. 1956, Apr., v. 42, No. 2, 126–36, 7 figs. (6 on 2 pls.). [21 refs.]

Ranque, J. & Faure, A. Sensibilité de *Sciurus vulgaris* à la leishmaniose viscérale. [**Susceptibility of** *Sciurus vulgaris* **to Visceral Leishmaniasis**] *Bull. Soc. Path. Exot.* 1956, Jan.–Feb., v. 49, No. 1, 40–43.

Dostrovsky, A. [**Early and Late Leishmaniasis**] *Harefuah.* Jerusalem. 1956, Apr. 15, v. 50, No. 8 [in Hebrew 165–7. (19 refs.) English summary 168].

This article refers exclusively to cutaneous leishmaniasis and is based on experimental work and clinical observations. The author distinguishes between early lesions occurring in people who have not previously been infected with leishmaniasis and late lesions which may occur with waning immunity either by renewed infection or endogenously from a quiescent focus. In early leishmaniasis, superinfection, either natural or experimental, is possible during the incubation period and until full recovery. The early lesion is a granulomatous infiltration containing abundant leishmaniae with occasional secondary nodules in the lymph vessels leading to regional glands. These nodules subside but may remain foci from which late endogenous lesions arise. Other late endogenous lesions arise from hidden foci. The late lesions are of a chronic inflammatory tuberculoid nature and may develop in the scar of the original lesion. Although associated with waning immunity the sensitivity test is usually stronger in late leishmaniasis than in the early form.

*Frederick J. Wright*

Caronia, G. Terapia e profilassi della leishmaniosi. [**Treatment and Prophylaxis of Leishmaniasis**] *Malattie da Infezione.* Rome. 1955, Jan.–Feb., v. 1, No. 1, 1–24. English summary.

A general review and discussion.

Floch, H. & Casile, M. Intradermo-réaction de Monténégro à la leishmanine. [**Leishmanin in the Montenegro Skin Test**] *Bull. Soc. Path. Exot.* 1955, v. 48, No. 5, 636–42. [11 refs.]

Mucocutaneous leishmaniasis is common in French Guiana, and the incidence in the population was studied by means of the Montenegro test, with the use of an antigen prepared from cultures of *Leishmania braziliensis* on NNN medium by the Instituto Adolfo Lutz (of São Paulo). Of 154 patients investigated at the Hôpital-Hospice Saint-Louis, 34 per cent. showed old or recent clinical evidence of the disease; but if forest dwellers only were included the infection rate rose to 45 per cent. The corresponding indices for positive Montenegro tests were 52 per cent. and 70 per cent. Only 5 patients exhibited active signs of the disease, and one of these, with a history of only 23 days, gave a feebly positive skin reaction. Of 53 patients with old leishmanial scars, 52 gave a positive test, and it was thought that the single negative could have been of non-leishmanial origin. Among 64 patients from the forest but showing no scars, 47 per cent. gave a positive reaction; among 37 who had not

lived in the forest, none gave a positive reaction. These findings suggest that sub-clinical infection is not uncommon.

The Montenegro reaction was specific for leishmaniasis, no cross-immunity occurring in leprosy, histoplasmosis or coccidioidomycosis.

*P. C. C. Garnham*

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## FEVERS OF THE TYPHUS GROUP

*In this section abstracts are arranged as far as possible in the following order:—general; louse-borne typhus, flea-borne typhus, mite-borne typhus; rickettsialpox; tick-borne typhus; Q fever, other rickettsial diseases.*

See also p. 1189, Blanc, Conservation dans la nature de virus pathogènes pour l'homme. Une observation marocaine. [**Natural Reservoirs of Organisms Pathogenic for Man; Observations in Morocco**]

Bovarnick, Marianna R. **Phosphorylation accompanying the Oxidation of Glutamate by the Madrid E Strain of Typhus Rickettsiae.** *J. Biol. Chem.* 1956, May, v. 220, No. 1, 353–61. [27 refs.]

Hara, Y. & Abe, T. **The Influence of Chemotherapy on the Mortality Rates of Tsutsugamushi Disease in Northern Japan, and some other Statistical Information.** *Amer. J. Trop. Med. & Hyg.* 1956, Mar., v. 5, No. 2, 218–23, 4 figs.

In Japan there are reliable records of the number of cases and deaths of persons attacked by tsutsugamushi disease from 1917 to the present time.

From 1917 to 1948 the case-fatality rates in the 5 chief endemic areas ranged from 20·2 per cent. to 45·8 per cent. With the introduction of the modern broad-spectrum antibiotics there was a sudden fall in the death rate and in the 3 years 1952–54 there was not a single death among the 273 cases that occurred. The dramatic change in the fatality rate is shown by the following figures. During the 5 years 1944–48 there were 201 cases with 62 deaths; in 1949 there were 36 cases and 3 deaths; in 1950 there were 117 cases and 7 deaths; in 1951 there were 100 cases and only 1 death; since 1951 no death has been reported.

The antibiotics given during the past 6 years were chloramphenicol, chlortetracycline, oxytetracycline, tetracycline and carbomycin.

No opinion is stated with regard to the relative efficacy of the different antibiotics, but it is mentioned that among the 228 patients treated with chlortetracycline 5 died; the authors thought that the diagnosis of the fatal cases came too late for them to respond to treatment.

[According to KATSURA, chlortetracycline is the drug of choice; oxytetracycline and tetracycline are also very effective; chloramphenicol, carbomycin and erythromycin were found considerably weaker (see this *Bulletin*, 1956, v. 53, 302).] *John W. D. Megaw*

LACROIX, A. C., SAYAG, A. & DOUARD, T. Observations sérologiques sur la Q fever (Burnet-Derrick) dans la région algéroise. [**Serological Studies on Q Fever in the Algiers Area**] *Bull. Soc. Path. Exot.* 1956, Jan.–Feb., v. 49, No. 1, 18–21.

The authors found that 18 of 122 (14·6 per cent.) workers at the abattoir at Algiers gave positive complement-fixation tests with Q fever antigen at titres of 1 in 16 to 1 in 32. The number of positives in 178 sheep at these titres or above was 12, and in 10 cattle it was 4: all of 4 goats were negative.

None of the cattle were positive before the age of 1 year, while 29·6 per cent. of the sheep gave positive results in 6 to 12 months.

*H. J. O'D. Burke-Gaffney*

GRIST, N. R. **Q Fever in South-West Scotland.** *Scottish Med. J.* 1956, May, v. 1, No. 5, 173–6. [13 refs.]

The survey described in this paper shows that Q fever is uncommon in man in South-West Scotland and that infection among cattle and sheep in the region is correspondingly scanty and is patchy in distribution.

The sera of 676 patients in the Ruchill Hospital, Glasgow, and other hospitals in the region were tested with the complement-fixation reaction against the Nine Mile strain of *Rickettsia burneti*. Among 377 cases of pneumonia in adults one reacted at 1 in 16 and one at 1 in 32; of 123 babies with pneumonia one reacted at 1 in 16 and one at 1 in 64; the reactions in these 4 patients were at constant titres. Among 92 patients with "virus pneumonia" one reacted at 1 in 16 on the 9th day and at 1 in 64 on the 22nd and 37th days. The remaining 84 patients were diagnosed as cases of "P.U.O."; none of them reacted.

Sera of 427 sheep from a Glasgow abattoir yielded 3 positive reactions (0·7 per cent.) at 1 in 16. Sera of 503 cattle sent for brucellosis testing yielded 4 positives (0·8 per cent.) at 1 in 16. The positive reactions occurred in 2 of 259 cows from Perthshire, in 1 of 57 from Stirlingshire and in 1 of 18 from Lanarkshire, but in none of 140 from other counties of the region and in none of the 29 cattle from other regions or of unknown origin.

Samples of sera were tested from 471 guineapigs which had been inoculated with milk received for routine tuberculosis testing; they included 57 samples of pasteurized milk from Glasgow and a few "follow up" samples obtained in attempts to confirm positive results or to trace the sources of infected milk. Complement-fixation titres of 1 in 64 or

more were regarded as evidence of the presence of living *R. burneti* in the milk samples; 3 such titres occurred among 43 samples from Dumfries County, 3 among 71 samples from Clydebank and 1 among 166 samples of raw milk from Glasgow. There were no positive reactions at titres of more than 1 in 16 among guineapigs inoculated with 76 samples from Stirlingshire, 29 from Wigtownshire, 15 from Kirkcudbrightshire, 8 from Falkirk and 6 from Dumfries.

The 7 infected milks came from at least 5 farms in 4 of which limited follow-up tests were made. In one farm serological evidence of infection was found in 4 of 53 milk cattle and from 3 of these 4 the milk contained *R. burneti* detectable by guineapig inoculation. Of 6 human sera collected from this farm 2 gave fixation titres of 1 in 16.

The paper contains a documented summary of what is known of the distribution of Q fever in man, cattle and sheep in Great Britain.

*John W. D. Megaw*

Brotherston, J. C. & Cooke, E. R. N. **Q Fever in Kenya.** *East African Med. J.* 1956, Apr., v. 33, No. 4, 125–30. [15 refs.]

The authors report the occurrence in Kenya of 4 cases of Q fever showing characteristic clinical signs and substantiated by high titres in convalescent sera tested by the conglutination complement-absorption test and the haemolytic complement-fixation test. Three out of the 4 cases had been tested also in the acute phase and showed no antibodies in 2 and only to a low titre in 1. The sera of 35 cattle were examined also and the results were as follows—positive 20, negative 13, doubtful 2. The infection thus appears to be common in cattle which are exposed to ticks, and the dusty conditions which often prevail favour the spread of the disease. Three of the 4 human cases reported were in Europeans, 2 living at a meat factory, the third was a veterinary stock inspector and the fourth an African woman. The authors conclude that many of the undiagnosed short-term fevers in East Africa may be, in fact, Q fever and that the disease must be regarded as an occupational hazard.

*Frederick J. Wright*

Orfei, Z. Sviluppo e morfologia della *Coxiella burnetii* nell'embrione di pollo, in condizioni normali e dopo trattamento con aureomicina.—Nota I. Ricerche istologiche su preparati di sacco vitellino. [**Development and Morphology of *Rickettsia burneti* in the Chicken Embryo in Normal Conditions and after Treatment with Aureomycin.—Note I. Histological Studies on Vitelline-Membrane Preparations**] *Rendiconti Istituto Superiore di Sanità*. Rome. 1956, v. 19, Pts. 2/3, 178–81, 6 figs. on 3 pls. [15 refs.]

The English summary appended to the paper is as follows:—

"The author studies the development of *Coxiella burnetii* (strain 'Grottazzolina') on the chicken embryo. The development of the

Rickettsia, at times in very large numbers, in the entodermic cells of the vitelline membrane is established, similar to the case of *Rickettsia prowazeki*. Administration of aureomycin three days after infection has no appreciable effect on the development of the Coxiellae."

Mazzitelli, L. La reazione di agglutinazione microscopica di *C. burneti*: osservazioni nel corso di una indagine sierologica sulla diffusione della febbre Q in ovini e bovini. [**The Microscopic Agglutination Test for** *Rickettsia burneti*; **Serological Study on the Incidence of Q Fever in Sheep and Cattle**] *Riv. Istituto Sieroterap. Ital.* 1956, Mar.–Apr., v. 31, No. 2, 135–46, 6 figs. [40 refs.]

The English summary appended to the paper is as follows:—

"The *C. burneti* microscopic agglutination test has been performed on 120 sera (60 oxen and 60 sheep). The same sera had been also tested by complement fixing reaction.

"With the agglutination reaction the experience of other workers was confirmed that specific antibodies are still present when no complement-fixing antibodies are detectable any more."

Ludwig, H. Q-Fieber-Pericarditis. [**Q Fever Pericarditis**] *Schweiz. med. Woch.* 1956, May 12, v. 86, No. 19, 490–91, 5 figs.

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## RABIES

Collier, W. A. & Tiggelman-van Krugten, V. A. H. **Bat-Lyssa in Surinam.** *Documenta Med. Geograph. et Trop.* Amsterdam. 1956, June, v. 8, No. 2, 185–8. [Numerous refs.]

"During an epidemic among bovine cattle in the vicinity of the town of Paramaribo (Surinam) a virus was isolated from the brains of a dead animal by intracerebral inoculation in mice; the protection test was made with the serum of rabbits, immunized against fixed virus. The results proved that the isolated virus was a strain of lyssa. Further researches revealed the presence of Negri bodies in intracerebrally infected mice.

"Dog-lyssa is non-existent in Surinam. The type of lyssa occurring in cattle is usually called 'paralytic' lyssa, but it is better, from an epidemiological point of view, to speak of 'bat-lyssa' as opposed to 'lyssa of carnivores'."

Rocha Lagôa, F. O problema da raiva em Minas Gerais. [**The Rabies Problem in Minas Gerais, Brazil**] *Mem. Inst. "Ezequiel Dias"*. Belo Horizonte. 1955, v. 6, No. 1, 5–16, 1 map. [10 refs.]

Suri, J. C. & Ahuja, M. L. **A Note on the Value of Tincture Iodine in the Local Treatment of Wounds inflicted by Rabid Animals.** *Indian J. Med. Res.* 1956, Apr., v. 44, No. 2, 375–6.

"The use of tincture iodine is of value when used as a first-aid treatment of wounds infected with rabies street virus. It is, however, not quite as effective as carbolic acid or nitric acid."

[See this *Bulletin*, 1956, v. 53, 177.]

Mukherjee, B. B. & Dey, S. K. **Neuroparalytic Accident following Antirabic Vaccine Treatment.** *J. Indian Med. Ass.* 1956, Apr. 16, v. 26, No. 8, 311–13. [10 refs.]

After briefly reviewing the literature on the case, age and sex incidence, on the time relationship to specific treatment and on the clinical varieties of neuroparalytic accidents complicating anti-rabies vaccination, the authors refer to 7 such accidents reported in Indian medical journals between 1942 and 1955 and describe in detail a case which came under their own observation in October 1955.

The patient, a 36-year-old Hindu male, had been bitten on the left foot by a rabid dog on September 7, 1955, and treated with 5 per cent. Semple vaccine in a daily dosage of 5 cc. on 14 consecutive days, the first injection having been given 3 days after the time of biting. On October 3, *i.e.*, 10 days after the completion of treatment, the patient became feverish and complained of headache and generalized pain; 48 hours later he had retention of urine and was admitted to hospital the following morning. Thereafter for 3 days his condition showed little change, but on October 9 he suddenly developed complete paraplegia of the lower extremities; knee and ankle reflexes were completely lost; plantar and abdominal reflexes showed no response; neck rigidity was present; the temperature rose to 104°F., but consciousness was not affected. On lumbar puncture the cerebrospinal fluid was found to be under moderately increased pressure and to contain 118 leucocytes per cmm. and protein 160 mgm. per cent. The patient's condition now progressively worsened: he developed flaccid paralysis of the upper extremities, without sensory loss; he became semi-conscious; his pupils were pin-point, with no reaction to light; and there was complete paralysis of the oculomotor nerves. Later the patient became comatose and died from failure of the medullary centres and oedema of the lungs. Post-mortem examination was not allowed.

Such a clinical picture of an acute fulminating type of ascending

paralysis developing 10 days after the completion of anti-rabies treatment naturally suggested the possible diagnosis of a neuroparalytic accident. In this case differential diagnosis of the condition from the paralytic form of rabies rested mainly on the shortness of the incubation period (26 days) in a patient bitten on the foot and receiving treatment sufficiently early and complete to obviate the likelihood of rabies developing. *G. Stuart*

Tiner, Ş. H. & Dürüşken, Ö. Ş. Kuduz aşisi sonu meydana gelen miyelitis vak' asi münasebetiyle. [**A Case of Myelitis occurring during the Antirabic Vaccination**] *Hastane.* Istanbul. 1956, Mar., v. 10, No. 3, 105–9.

The English summary appended to the paper is as follows:—

"A woman aged 45 had paraplegia during antirabic vaccination.

"The investigations showed that the cause was this vaccination.

"The mixture of the fixed virus with heterogenic albumin provoked the nervous injury. The localization varied according to the affinity of the diverse parts of the nervous system."

Skewes O., E. & Baeza H., H. Complicaciones de la vacuna antirrábica. [**Complications of Anti-Rabies Vaccination**] *An. Méd. Concepción.* 1955, June, v. 12, Nos. 1/2, 19–25, 4 figs. [25 refs.] English summary.

An account of 2 cases.

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## PLAGUE

Bhagavan, N. V., Chen, T. H. & Meyer, K. F. **Further Studies of Antigenic Structure of *Pasteurella pestis* in Gels.** *Proc. Soc. Exper. Biol. & Med.* 1956, Mar., v. 91, No. 3, 353–6. [15 refs.]

"*Pasteurella pestis*, virulent or avirulent, contains 7 antigens demonstrable in the Oudin test. Five are common to *P. pseudotuberculosis*; 3 of these are thermolabile and 2 are thermostable. Of the 7 antigens of *P. pestis* 4 are thermolabile and 2 thermostable. The remaining antigen is haptenized Fraction I. Formalin affects all of the antigens except one, rendering them thermolabile; toluene does not affect them."

[See this *Bulletin*, 1955, v. 52, 1191.]

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## CHOLERA

Olitzki, A. L. & Olitzki, Z. **Pathogenicity and Antigenicity of Streptomycin Dependent Mutants of *Vibrio comma* (Types: Inaba and Ogawa).** Reprinted from *Exper. Med. & Surgery.* 1955, Dec., v. 13, No. 4, 332–8.

" Streptomycin dependent (D) vibrios (Inaba and Ogawa) were avirulent for mice when given intraabdominally suspended in mucin up to $10^8$ organisms, and for guinea pigs suspended in broth up to $4 \times 10^9$ organisms. Repeated injections of $10^7$–$10^8$ D-vibrios protected mice, and of $10^9$–$4 \times 10^9$ D-vibrios protected guinea pigs against challenge with several lethal doses of virulent vibrios suspended in broth.

" $10^7$–$10^8$ Ogawa D-vibrios also protected mice against 100 lethal doses of virulent vibrios suspended in mucin.

" By repeated injections of living D-vibrios intravenously into rabbits, in increasing quantities up to $5 \times 10^9$ organisms, agglutinating sera with O-titers of up to 1:200,000, and H-titers up to 1:1000 were produced."

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## AMOEBIASIS AND INTESTINAL PROTOZOAL INFECTIONS

*In this section abstracts are arranged as far as possible in the following order:—epidemiology, aetiology, pathology, diagnosis, clinical findings, treatment, control.*

Franco, A. & Mühlpfordt, H. Protozooses intestinais no Arquipélago de Cabo Verde. I)—Ilha de S. Vicente. [**Intestinal Protozoal Infections in Cape Verde Archipelago, Isle of St. Vincent**] *Anais Inst. Med. Trop.* Lisbon. 1955, Dec., v. 12, No. 4, 593–631, 1 map & 2 graphs & 1 diagram. [Numerous refs.] English summary.

This report elaborates at great length the results of the examination of faecal specimens from 531 inhabitants of the Isle of St. Vincent, of both sexes, all age-groups and varied strata of society, to determine the incidence of intestinal protozoal infections. A comparable investigation was carried out by Ferreira and Egregas in 1942–43 [this *Bulletin*, 1946, v. 43, 442] but was concerned almost exclusively with Europeans who had been resident in the archipelago for relatively short periods of time. The present report deals with the indigenous population and very few Europeans, all of whom have been very long resident. This probably explains the much higher infection rates now reported.

Of the 531 persons examined 396 (74·57 per cent.) harboured intestinal protozoa, *Entamoeba histolytica* 102, *E. coli* 228, *Iodamoeba bütschlii*

116, *Endolimax nana* 77, *Dientamoeba fragilis* 21, *Gardia intestinalis* 74, *Chilomastix mesnili* 54, *Trichomonas hominis* 86, *Balantidium coli* 1. This is the first reported finding of *B. coli* on the island.

*Norman White*

Chitkara, N. L. & Chuttani, H. K. **Liver Function in Intestinal Amebiasis.** *Amer. J. Trop. Med. & Hyg.* 1956, Mar., v. 5, No. 2, 213–17. [17 refs.]

"Liver function study was carried out on 26 cases of symptomless carriers, and 28 cases of intestinal amebiasis with symptoms. High serum globulin values were the only evidence of hepatic dysfunction in 9 cases (34·6 per cent) of symptomless carriers; other liver function tests were normal. High serum globulin, abnormal cephalin cholesterol flocculation and thymol flocculation tests were observed in 15 cases (53·6 per cent), 6 cases (21·4 per cent) and 3 cases (10·7 per cent) respectively, in cases having symptoms."

Pfannemueller, L. **Treatment of Amoebiasis with Resotren.** *Lancet.* 1956, June 16, 934–5. [11 refs.]

Forty-two patients with amoebiasis were treated in Iraq with Resotren, a combination of chloroquine and iodohydroxyquinoline which is slowly broken down in the small intestine releasing the two basic components [see this *Bulletin*, 1952, v. 49, 620; 1953, v. 50, 813; 1954, v. 51, 924, 925; and later].

Five of the patients suffered from uncomplicated amoebic dysentery, 31 from dysentery and amoebic hepatitis, and 6 from dysentery and a liver abscess. Additional chloroquine was given to these 6, and in one case the abscess content was aspirated. Clinical cure followed the treatment in all cases, and the stools of all but 2 were free from parasites at that time. "Search for *Entamoeba histolytica* in the stools during six months after treatment gave negative results" [but the number of stools searched and the method of search are not specified]. The author is satisfied that the liver is involved in amoebic dysentery more often than is generally realized, that this method of treatment therefore is sound, and that this particular drug is both well tolerated and effective in all forms of amoebiasis.

*A. R. D. Adams*

Halawani, A., Abdallah, A., El Kordy, M. I. & Saif, M. **On Antibiotics in Acute Intestinal Amoebiasis. Aureomycin, Terramycin, Achromycin, Erythromycin, Neomycin and Fumagillin.** *J. Egyptian Med. Ass.* 1955, v. 38, No. 12, 718–26.

The authors have already reported on their experiences with chlortetracycline (aureomycin) [this *Bulletin*, 1951, v. 48, 155 and 806].

They now record the results of treatment of acute cases of amoebic dysentery with oxytetracycline (Terramycin), tetracycline (Achromycin), erythromycin (Ilotycin), neomycin and fumagillin. Of 10 patients treated with oxytetracycline all were clinically relieved of their dysentery, but 2 relapsed within 40 days and 2 others later; for 13 treated with tetracycline the figures were 12 clinical recoveries and 1 relapse within 40 days, 4 others relapsed later; in 26 given erythromycin there were 24 recoveries, 5 relapses within 40 days, and 4 others later; in 4 given neomycin there were no recoveries; in 26 given varying doses of fumagillin there were 14 recoveries, and 6 relapses within 40 days and others later. The details are set out in tables.

The authors consider that chlortetracycline, oxytetracycline and tetracycline are satisfactory drugs for the treatment of acute amoebic dysentery, but that the other antibiotics tried were not. Antibiotic treatment is ineffective against amoebic hepatitis, and a liver abscess may indeed develop during its employment. *A. R. D. Adams*

Frye, W. W. La terramycine dans le traitement des maladies tropicales. [**Oxytetracycline in the Treatment of Tropical Diseases**] *Bull. Soc. Path. Exot.* 1955, v. 48, No. 6, 773–7.

Oxytetracycline [Terramycin] has yielded good therapeutic results in Weil's disease if given early, in various rickettsioses including rickettsialpox and Q fever, in infections with certain large viruses, such as lymphogranuloma venereum, in yaws for the clearance of the destructive and crippling lesions which prove resistant to penicillin treatment, and in threadworm and roundworm infections.

Patients suffering from acute amoebic dysentery were treated in a prison camp in Korea in 1951 with oxytetracycline, chlortetracycline [aureomycin], chloramphenicol, or with the more usual amoebicides. The data are set out in tables. From these it emerges that oxytetracycline treatment for 10 days proved very satisfactory, and compared more than favourably with treatment with any other of the drugs, or combination of drugs, given to comparable series of patients. Chloroquine is the drug of choice for the treatment of hepatic amoebiasis, but oxytetracycline is indicated for the control of the secondary bacterial infection associated with it.

In the Korean camp there also was a considerable epidemic of bacillary dysentery. Of 274 of these patients treated with oxytetracycline none gave positive stool cultures after the seventh day; yet after sulphadiazine treatment 25 per cent. were stool-positive at that time; and in a group of controls palliatively treated 29 per cent. were still stool-positive. Similarly, after treatment with polymyxin B 12 per cent. were positive, after chloramphenicol 1 per cent., and after chlortetracycline 1 per cent.

*A. R. D. Adams*

Young, M. D. & Freed, J. E. **The Effect of Puromycin against *Entamoeba histolytica* and other Intestinal Parasites.** *Southern Med. J.* 1956, May, v. 49, No. 5, 537–8.

"Puromycin was shown to be efficacious against asymptomatic infections of *Entamoeba histolytica*. Four grams given over a 4 day period eliminated infections in the 14 patients tried. Lower daily or total dosages eliminated 15 of 21 infections with *E. histolytica*.

"The drug in total dosages as low as 2·0 Gm. given in 5 days also removed all of the other intestinal protozoa present, totalling 37 infections.

"Of three *Enterobius* infections, the two given the 4 Gm. in 4 days regimen were eliminated. No effect was demonstrated against hookworm, *Strongyloides*, or *Trichuris*.

"The drug was well tolerated. No untoward effects were observed in the 38 patients treated."

Hara, K., Takagi, K., Oka, S., Nagasawa, Y. & Sawada, T. **Studies on the Toxic Effect of *Entamoeba histolytica* on the Parenchymal Organs of Mice.** *Gunma J. Med. Sci.* 1955, Oct., v. 4, No. 3, 201–12, 4 figs. [22 refs.]

*Entamoeba histolytica* is assumed to contain certain toxic substances, which were extracted from 48-hour cultures in Tanabe-Chiba medium. Bacterial growth was inhibited by the use of antibiotics. The amoebae (30,000–50,000 per ml.) were frozen and thawed in Ringer's solution. The suspension was centrifuged and the supernatant fluid was stored at 4°C. and used as the source of toxin. Eighteen albino mice were inoculated subcutaneously with this extract, some receiving 8 and others up to 51 daily injections; 8 controls were given plain Ringer's solution. The mice were killed at varying periods from one day upwards, and sections of liver, spleen, kidney, heart and lungs were prepared and studied.

The parenchyma cells of the liver were said to show the most striking changes. One or two days after inoculation, hypertrophied parenchyma cells were found, with vacuolization of the cytoplasm and nucleus, mitochondrial degeneration and abnormal mitotic figures (such as tripolar and chrysanthemum forms). These changes gradually diminished and were rarely observed after 10 days. The spleen and lung showed evidence of the occurrence of increased haemolysis by the accumulation of haemosiderin, but the other organs appeared normal. The authors think that their findings suggest that an amoebic endotoxin exists which has a striking effect on the parenchyma cells of the liver.

[For a journal which uses English as its medium, it would be worth while employing someone who could rewrite the papers in good English. The present paper might be quite valuable, but in its present form it is impossible to assess the validity or meanings of its findings or conclusions.] *P. C. C. Garnham*

Tovar-Escobar, G. & Barnola Duxans, J. Giardiasis en niños. [**Giardiasis in Children**] *Jornadas Nacionales de Puericult. y Pediatr.* Valencia. 1955, Mar. 2–6, v. 2, 727–37.

The authors show in a table that *Giardia* was found in 2,546 (7·7 per cent.) of 33,033 children examined in the Municipal Children's Hospital in Caracas, Venezuela, between 1947 and 1953. After a discussion of the pathogenicity and symptoms of this disease they describe a study of 4 groups of children investigated in that hospital.

These were (1) 103 children between the ages of 2 and 12 with *Giardia* in the stools on routine examination. Of these, 30 per cent. had gastro-intestinal symptoms, including diarrhoea and dysenteric manifestations. In several of these last groups, other parasites were also present.

(2) 102 children with a history of enterocolitis of a dysenteric type: of these 14 had *Giardia* in the stools, 19 had *E. histolytica* and 5 had both: all of those with Giardia had one or more helminths as well.

(3) 13 children with a diagnosis of coeliac syndrome: only 1 harboured *Giardia*.

(4) 23 private patients in whom *Giardia* was found: 20 showed symptoms, of which diarrhoea was the commonest.

The children in both groups were treated with several of the usual drugs. The hospital children showed little response: the private patients fared better; 8 of 17 treated with mepacrine were rid of their infections. Aralen [chloroquine] also removed the parasite in 2 of 3 private patients, but only from 3 of 18 hospital patients.

The authors point out that *Giardia* was found mostly in undernourished children with multiple parasitic infections, while the private patients were in a much better physical state: they tended to show definite symptoms which responded well to treatment.

*H. J. O'D. Burke-Gaffney*

Céspedes, R. & Morera, P. **Balantidiosis.** *Rev. Biologia Trop.* San José, Costa Rica. 1955, Dec., v. 3, No. 2, 161–70, 9 figs.

The English summary appended to the paper is as follows:—

"Nine cases of human balantidiasis are presented, six of them located in the appendix, three appearing as active acute colitis.

"The colitis forms were violently acute and had a rapid fatal issue, with perforation of the colon wall and peritonitis in two cases.

"The appendicular cases evolved slowly, always with the antecedent of abdominal pain predominantly on the right iliac fossa. Only one of the appendicular cases showed perforation and caused a periappendicular abscess.

"None of the appendicular cases was fatal, although one had a very difficult post-operative picture. In two of the cases of colitis and one of the cases of appendicitis, balantidiasis was associated with trichocephalosis.

" When no bacterial complication exists, *Balantidium* lesions are characterized by ulcers affecting the mucosa and submucosa and are predominantly hemorrhagic.

" In one fatal case trophozoites of *B. coli* were found within one vein in the submucosa. No hepatic lesions were found in any of the cases. Of the nine cases eight came from rural areas, one from an urban zone. There is on record also a case of a carrier of *B. coli*.

" The low incidence of human balantidiasis in this area is stressed."

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## RELAPSING FEVER AND OTHER SPIROCHAETOSES

Davis, G. E. & Hoogstraal, H. Étude sur la biologie du spirochète *Borrelia persica*, trouvé chez la tique *Ornithodorus tholozani* (Argasinae) récoltée dans le " Governorate " du désert occidental égyptien. Commentaires sur la distribution et l'écologie de la tique vectrice. [**A Study of the Biology of the Spirochaete** *Borrelia persica*, **found in the Tick** *Ornithodorus tholozani* **collected in the " Governorate " of the Western Egyptian Desert; Notes on the Distribution and Ecology of the Tick Vector**] *Ann. Parasit. Humaine et Comparée.* 1956, Jan.–Mar., v. 31, Nos. 1/2, 147–54. [13 refs.]

Four lots of *Ornithodorus tholozani* were collected from burrows near Sidi-Barrani and sent to the Rocky Mountain Laboratory at Hamilton, Montana, to be examined for infectivity. The hosts of this tick in nature included the spiny mouse (*Acomys*), the sand rat (*Psammomys*), and the hedgehog (*Hemiechinus*). *O. erraticus* was commonly found in the same burrows. In Egypt, *O. tholozani* seems to be confined to a narrow littoral region extending from about 10 miles east of Mersa Matruh to the Libyan frontier. The species is also widely distributed, having been recorded from various parts of Asia Minor, and as far east as Afghanistan and Kashmir.

Three out of the 4 lots were found to contain varying percentages of infected ticks which were tested by feeding them on guineapigs and white mice, and also by inoculation of the triturated organs of ticks into these animals. Spirochaetes were isolated in 36 cases out of a total of 348 ticks examined.

The Egyptian strain of relapsing fever spirochaete shows a well marked local specificity, for attempts to transmit the infection by *O. tholozani* respectively from Israel, Jordan, and the U.S.S.R. gave uniformly negative results. The infection had died out in ticks from Jordan after an interval of 3 months and 24 days; but in ticks from Israel it survived at least 3 months and 19 days, and in ticks from U.S.S.R. for 14 months and 21 days. Guineapigs, both young and adult, the white mouse and golden hamster showed varying degrees of susceptibility to the infection,

but the guineapig is the most satisfactory host, as in the case of other strains of *Spirochaeta persica*. *Edward Hindle*

Lovett, W. C. D. **Eradication of Tick-Borne Relapsing Fever in the Somaliland Protectorate by a Tick Destruction Programme.** *Trans. Roy. Soc. Trop. Med. & Hyg.* 1956, Mar., v. 50, No. 2, 157–65, 1 graph. [13 refs.]

Tick-borne relapsing fever has long been prevalent and epidemic in Somaliland where it is emphatically a disease of towns, and in them largely of places of public resort, and not of nomadic settlements. The common Argasid ticks are *Ornithodorus moubata* and *O. savingyi*. Circumstantial evidence, particularly of location, suggests strongly that the former is the sole host of relapsing fever, and this has been confirmed by the eradication of the disease after its exclusive control. The major centre of transmission was Burao. After preliminary experiments control was started with a water suspension of benzene hexachloride in the form of Gammexane P 520, at a dose of 15 mgm. active substance per square foot of floor treated. Three applications were made at intervals of one month, but because of promising results the programme was later limited to 2 applications with an interval of 4 to 6 weeks. The disease showed a steady though not immediate decline. The campaign was extended first to the capital, Hargeisa, and later to a few settlements which were shown on epidemiological enquiry into the antecedents of cases to be foci of transmission. Work started in 1949, and the last known case of relapsing fever occurred in September 1952, since when there has been no indigenous occurrence. The total cost of the campaign was about £400. It is remarkable in that it is based on the concept that infective *O. moubata* are strictly limited in their distribution and confined to a few foci which can be identified and in which full control can be established.

[See also this *Bulletin*, 1947, v. 44, 1070.] *G. Macdonald*

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## YAWS AND OTHER TREPONEMATOSES

Ghestin, F. Le traitement du pian par la benzathine-pénicilline. [**Treatment of Yaws with Benzathine Penicillin**] *Bull. Soc. Path. Exot.* 1955, v. 48, No. 5, 643–9, 8 figs. on 4 pls.

This article reports very satisfactory results from single injections of benzathine penicillin used in the treatment of 69 children under the age of 14 years in Gabon suffering from primary and secondary yaws. The dose used was 100,000 units per kgm. body weight up to a maximum of 1·2 mega units. Only patients suffering from crab yaws are liable to

require a second injection. Illustrative plates demonstrate the rapid disappearance of lesions. A treatment which renders the lesions rapidly non-infective, is cheap and easy to give and produces rapid clinical improvement, is very suitable for the conditions under which yaws is found.

[While relapses have been reported from elsewhere, this treatment is being widely practised with success. (See also this *Bulletin*, 1953, v. 50, 775; and 1955, v. 52, 50.)] *Frederick J. Wright*

Medina, R. & Abreu A., C. Campaña contra la buba en Venezuela. [**Campaign against Yaws in Venezuela**] *Rev. Sanidad y Asistencia Social.* Caracas. 1954, Sept.–Dec., v. 19, Nos. 5/6, 345–59, 1 map on pl.

The campaign against yaws in Venezuela was launched in 1938. The present report summarizes the work carried out by the Anti-Yaws Commission between January 1943 and December 1950. In 1943 the work was concentrated in 3 areas, a central area comprising the Federal District and the States of Miranda, Aragua and Carabobo; a western area comprising the States of Yaracuy and Trujillo; and an eastern area formed by the State of Sucre. The total personnel available for the work was only 26 and the area to be covered aggregated 46,110 square kilometres. Treated localities had to be revisited every six months. The task proved too great for the available staff so in 1945 the States of Trujillo and Sucre were omitted from the scheme. They were readmitted in 1949 when experience with penicillin in the treatment of the disease had almost halved the time necessary to devote to each treated locality.

The total population of the areas treated between January 1943 and May 1949 was 780,331, all in scattered rural communities. The promiscuity imposed on these people by the primitive dwellings they occupy facilitates the transmission of the infection from the sick to the healthy by direct contact. The total number of infective patients discovered and cured during these years was 18,560, 2·38 per cent. of the population examined. The percentage of infective persons varied between 3·67 in 1943 and 1·18 in 1949. In addition 12,637 non-infective cases were discovered and treated.

In May 1949 penicillin replaced bismuth in the treatment of yaws. From then to the close of 1950 440,550 persons were examined, among whom 2,432 infective cases were discovered, 0·59 per cent., and a further 432 non-infective cases were noted and treated.

The age distribution of infective cases was highest, 33·70 per cent. in the 6–10-year age-group, followed by 33·22 and 17·35 per cent. in the age-groups 0–5 and 11–15. *Norman White*

## LEPROSY

*In this section abstracts are arranged as far as possible in the following order:—epidemiology, aetiology, pathology, diagnosis, clinical findings, treatment, control.*

DEL VECCHIO, G. Risultati di un recente censimento dei lebbrosi in Italia. Aggiornamento e precisazioni. [**The Results of a Recent Census of those suffering from Leprosy in Italy, brought up to date and checked**] *Ann. d. San. Pubblica.* Rome. 1955, Nov.–Dec., v. 16, No. 6, 1267–93. English summary (6 lines).

Last year (1954) saw a tremendous increase of those officially known to be suffering from leprosy in Italy. The distribution is greater in the south than in the north on the whole, but 45 patients are given in Liguria. The regions most affected are Calabria (98), Sicily (77), Apulia (50). The total number counted up to the end of 1954 was 434, of whom 188 were in institutions and 246 at home. It was found that the number had increased by 25 since the previous year. The number of household contacts amounted to 1,163. It is hoped by enlarging the existing leprosy hospitals at Genoa, Acquaviva delle Fonti, Messina and Cagliari, and by the construction of pavilions at Gioia del Colle, to provide accommodation for patients and thus stop the further spread of infection. Other legislative, welfare, economic, prophylactive and health measures are also required. *Ernest Muir*

LAURET, L. & KERBASTARD, P. Le problème des fausses réactions syphilitiques dans la lèpre. [**The Problem of False Positive Reactions for Syphilis in Leprosy**] *Bull. Soc. Path. Exot.* 1955, v. 48, No. 6, 789–95. [10 refs.]

A study of the literature shows that it has been a common belief that leprosy can cause a false positive serum reaction for syphilis; the TPI test should be capable of giving the correct answer but is not always available.

In their investigation these authors employed the following tests: Kolmer, Kline and VDRL. Of 126 patients free from leprosy 34 per cent. gave positive reactions compared with 31 per cent. of 239 treated for leprosy and 42 per cent. of untreated patients. When the Pallignost test in addition was carried out on 30 untreated sero-positive and 12 sero-negative cases of leprosy there was almost complete agreement between the 4 serum tests for syphilis and the TPI test. Another observer in the French Sudan reported similar results but EDMUNDSON and others [this *Bulletin*. 1955, v. 52, 1096] reported positive results as follows: Kolmer 63 per cent., Kahn 52·7 per cent., Rein-Bossach 51·8 per cent., VDRL 46·9 per cent., and TPI 11·2 per cent. They considered that they had

60 per cent. of false positives whereas Lauret and others estimate 36·6 per cent.; to what this divergence is due is not known.

The facts that classical tests agreed with TPI tests and that anti-syphilitic treatment reduced the titres of the classical tests lead to the conclusion that leprosy is not in itself a cause of false positive tests for syphilis. In this connexion it should be remembered that yaws and syphilis are endemic in the French Sudan. *T. E. Osmond*

Prieto Lorenzo, A. Manifestaciones neurales de la lepra. [**Neural Manifestations in Leprosy**] *Med. Colonial.* Madrid. 1956, May 1, v. 27, No. 5, 435–59, 11 figs. [20 refs.]

This is a fairly full account of the various changes found in the nervous system in leprosy and the resulting clinical manifestations. The author has noted a certain amount of confusion in the description of these lesions in the literature, and his paper is an attempt to present them in a clear and systematic form. In this object he is moderately successful. He first describes with the help of line drawings the areas of cutaneous nerve distribution in the upper and lower limbs, and the pathological and clinical changes which take place, especially in the tuberculoid type of leprosy. Next he describes the motor changes in the limbs and the face, and follows these with a description of trophic changes in muscles, skin and subcutaneous tissue, and in bones. Next he gives an interesting account of the disturbances of the vasomotor and secretory systems of the skin, and lastly he refers to the very rare pathological changes that have been found in the central nervous system, and to the mental conditions in leprosy which are not a direct but rather an indirect result of the disease. *Ernest Muir*

Utku, I. E. Travaux et resultats d'essais de la chimiothérapie de la lèpre en Turquie. [**The Work and the Results obtained in Testing Chemotherapy of Leprosy in Turkey**] *Türk Ijiycn ve Tecrübî Biyoloji Dergisi.* Ankara. 1956, v. 16, No. 1, 86–109. [Version in Turkish 60–85, 14 graphs. (50 refs.).]

Isoniazid (Rimifon) was first tested in rats infected with rat leprosy. When the highest tolerated doses were used in 5 rats, with an equal number of untreated rats as controls, it was found that isoniazid retarded but did not suppress the progress of the infection. Similar results were obtained in 2 other groups of rats. Isoniazid was then tried in 50 formerly untreated patients suffering from leprosy, and amelioration was obtained in 33 per cent., the general condition being improved especially in the acute and subacute phases of the disease. It was considered, however, that sulphones had an effect in leprosy 2 or 3 times greater than that of

isoniazid, but had the disadvantage of being much more toxic. It was found that a combination of sulphone and isoniazid therapy gave the best results and toxic effects were diminished. In 12 months there was improvement clinically in 87 per cent. of 50 patients, and bacteriologically in 91·3 per cent. The dose of isoniazid was 300 rising to 500 mgm. Good results were also obtained by injecting a solution of isoniazid into leprous nodules. *Ernest Muir*

Montestruc, E. Essais nouveaux de thérapeutique antilépreuse. [**New Trials in Anti-Leprosy Therapy**] *Bull. Soc. Path. Exot.* 1956, Jan.–Feb., v. 49, No. 1, 10–14.

The author gives the results of trials in leprosy of 5 therapeutic agents: Pasiniazide, Antibiotic 5337 RP, Largactil [chlorpromazine], *Mycobacterium marianum*, and salicylate of soda. Pasiniazide (a combination of PAS and isoniazid) had no effect in lepromatous cases by itself, though it seemed to speed up sterilization of the nasal mucosa when combined with DDS. Two tuberculoid patients, after treatment with sulphones for several months without result, were rapidly benefited by treatment with Pasiniazide. With the antibiotic (Rouamycin [Spiramycin] from *Streptomyces amboficans*) there was rapid clinical improvement in one patient, but in 3 others there was no improvement. Four patients who had made slight improvement with DDS were not benefited by the use of Largactil, and this drug had practically no effect in checking lepra reaction. The *Myco. marianum* antigen has been entirely abandoned after trial on 2 patients in whom it produced reactions which were difficult to control. In the treatment of severe reactions cortisone has been found of value, but the dosage has to be watched carefully, otherwise there is apt to be a relapse of reaction. Salicylate of soda intravenously was found of some use in relieving lepra reaction. *Ernest Muir*

Majumdar, T. D. **Clinical Experiences with Phenylmethyl Amine-P-Aminobenzene Sulphonate on Lepra Reaction.** *J. Indian Med. Ass.* 1956, Apr. 16, v. 26, No. 8, 314–15.

Case histories are given of 7 [apparently from the descriptions] tuberculoid cases of leprosy. These patients all suffered from "lepra reaction" and were treated with phenylmethyl amine-p-aminobenzene sulphonate. The swellings of skin and nerves subsided after 4 to 36 injections of 0·05 gm. given on alternate days, and these results were attributed to this drug, although other forms of treatment were given before or during the time of its administration. The editor of the journal, in a footnote, points out that there were no controls with other anti-allergic drugs, and that the effects obtained might have been due either

to delayed action of other treatment previously given, or to the natural tendency of such reactions to subside spontaneously. *Ernest Muir*

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## HELMINTHIASIS

*In this section abstracts are arranged as far as possible in the following order:*—TREMATODES *(schistosomes, other flukes);* CESTODES *(Diphyllobothrium, Taenia, Echinococcus, other cestodes);* NEMATODES *(Hookworms, Ascaris, Filarial worms, Dracunculus, etc., Trichuris, Enterobius, Trichinella, etc.).*

See also p. 1180, SIMITCH & PETROVITCH, La faune des parasites intestinaux en Yougoslavie. II.—La faune des helminthes intestinaux chez les enfants d'âge scolaire. [**Intestinal Parasites in Yugoslavia II. Intestinal Helminths in Schoolchildren**]

SANDOSHAM, A. A. **A Check List of the Helminth Parasites of Man in Malaya with Brief Notes on their Incidence.** *Proc. Alumni Ass., Malaya.* 1955, Dec., v. 8, No. 4, 258–65. [28 refs.]

About 28 different species of helminths have been recorded as infecting man in Malaya and of these about one-third are non-endemic, and have been found in immigrants to the country or in troops brought in to fight the terrorists. Of the species (about 17) believed to be endemic, some are either very rare (*e.g.*, guineaworm and *Fasciolopsis buski*) or are only accidental parasites of man (*e.g.*, *Echinostoma*, *Thelazia*, etc.). The " common " endemic species in man can be reduced to a small number which include *Trichuris trichiura*, *Strongyloides stercoralis*, hookworms (predominantly *N. americanus*), *Enterobius vermicularis*, *Ascaris lumbricoides* and *Wuchereria malayi*.

This useful check list also has notes on the incidence of parasites and comments on their abundance or scarcity: *e.g.*, *Clonorchis sinensis* although endemic in piscivorous mammals in Malaya is not so in man because the Chinese in Malaya have largely given up the habit of eating raw fish. *Taenia solium* is on the decline since the war when Malaya became more self-sufficient in pork supplies; and the importation of pigs, many of them infected with *C. cellulosae*, has been much reduced. Schistosomiasis is non-endemic although the 3 main species, *japonicum*, *haematobium* and *mansoni* are present as imported infections. *S. japonicum* cannot become established as there are no species of *Oncomelania* in Malaya; similarly with *S. haematobium*, though the author believes " we should maintain a vigilant attitude " towards the presence of this species. *S. mansoni* " is more widespread than *S. haematobium* and is capable of utilising a wider range of intermediate hosts and therefore is a source of greater potential danger to this country ". *J. J. C. Buckley*

Goeters, W.; Weise, H.; Wigand; Ammon, R.; Mohr, W.; Mayer, J. B. & Kremmer, H.; Scheid, G.; Fedtke, H. Die enzymatische Wurmbehandlung. [**The Enzyme Treatment of Helminthiasis**] [Correspondence.] *Med. Klin.* 1956, Mar. 23, v. 51, No. 12, 462–9, 1 chart. [21 refs.]

An editorial note which precedes the letters published here states that in the past months several communications have been received which throw doubt on the value of the enzyme treatment of helminthiasis. On the other hand, some clinicians who had used this therapy with success believed it possible that some of the adverse opinions were due to insufficient knowledge of the underlying principles and the proper technique of the treatment. The letters which follow the editorial note are from experienced workers who were invited to give their opinion in this enquiry.

The first letter (Professor W. Goeters) states the conflict of published opinion on the value of the papain preparations—Vermizyme and Nematolyt [this *Bulletin*, 1950, v. 47, 1203; 1951, v. 48, 489]—and gives particulars of his own experience which is that these preparations do not destroy *Enterobius* or *Ascaris* or the eggs. Two short letters then give no positive opinion. The results of a series of laboratory experiments on the digestion of *Ascaris* by means of Nematolyt are recorded in a long letter (Professor R. Ammon), and indicate that magnesium salts and also piperazine make the cuticle of the worm more sensitive to the proteolytic action of papain whereas desoxycholic acid inhibits this action. These results may be of importance from the clinical viewpoint. A communication from the Tropical Institute, Hamburg (Professor Werner Mohr) states that no satisfactory results were obtained by the use of the papain preparations in small trials and that the current treatment of ascariasis and of ankylostomiasis is by means of preparations of oil of chenopodium or of hexylresorcinol. Several other letters give more optimistic clinical accounts. In these the percentage of cures of ascariasis with Nematolyt ranged from 50 to 90 and one writer claims that every case can be cured by this preparation. Excellent results are also claimed in the treatment of whipworm infection. Treatment of threadworms has not been so effective but it is stated by one correspondent that a high percentage of cures can be achieved if the enzyme preparation is introduced both orally and rectally, and a strict technique for avoiding re-infection is maintained, together with concurrent treatment of the other members of the household. *M. E. Delafield*

Ayad, N. **Bilharziasis Survey in British Somaliland, Eritrea, Ethiopia, Somalia, the Sudan, and Yemen.** *Bull. World Health Organization.* Geneva. 1956, v. 14, No. 1, 1–117, 10 figs. (1 on pl.). [103 refs.]

The general nature and extent of the survey are outlined in the synopsis which precedes the report. No attempt was made to carry out extensive

or detailed investigations in any one area, but many of the recorded observations merit further investigation, the following two examples, selected at random, being typical.

Schistosomiasis had not been recorded in British Somaliland at the time of the author's visit and the local authorities were under the impression that vector snails did not occur in the area. Dr. Ayad, while confirming the apparent absence of cases of the disease, was able to demonstrate the presence of "*Biomphalaria* snails". He regards this as an important observation in view of the proposed installation of water reservoirs in the area.

Towards the end of his report the author gives an excellent summarization of the history of the spread of schistosomiasis in the Gezira, the cotton-growing area of the Sudan, and the various schemes devised to reduce its incidence and limit its spread. He concludes his article with the following suggestion. "It might also be advisable to follow up, in a chosen pilot area, Archibald's suggestion of planting *Balanites aegyptiaca* ('heglig') on the banks of watering-places. The tree flourishes in rainy as well as in arid regions and grows throughout tropical Africa, Arabia, Egypt, and Palestine. It fruits abundantly for six months and its berries, kernel, bark, roots, and branches all contain a substance which is lethal to molluscs, miracidia, and cercariae, but does not impair the potability of water. Archibald suggested dense afforestation of ponds and 'khors' adjacent to villages and of streams, especially the blind ends, as well as the treatment of stagnant water collections by emulsions made from the berries."

The author's views on future lines of research, which do not lend themselves to summarization and should be read in the original by those interested, reflect on the poverty of existing knowledge concerning the biology and methods of controlling snails responsible for the transmission of the various species of schistosomes parasitizing man. Some of the opinions expressed will not receive general agreement but no one will dispute the final sentence in the report. "There is no doubt that a successful attack on bilharziasis can be achieved only by team-work between physician, malacologist, chemist, and engineer."

*R. M. Gordon*

Pinto, A. R. Nota prévia sobre a incidência da bilharziose na Guiné Portuguesa. [**Incidence of Schistosomiasis in Portuguese Guinea**] *Anais Inst. Med. Trop.* Lisbon. 1955, Dec., v. 12, No. 4, 653–8, 2 folding coloured maps & 15 figs. on 8 pls. English summary.

Vesical schistosomiasis is an important cause of morbidity in the indigenous population of parts of Portuguese Guinea. *S. mansoni* infections are unknown.

*S. haematobium* infections are confined to the river basins in the north of the territory where the population is mainly engaged in the cultivation

of rice. Infection rates in the 4 chief endemic centres were: Caiomete River basin 54 per cent.; Cacheu River basin 13 per cent.; Geba River basin 34 per cent., and part of the Corubal River basin 18 per cent. The infection in these areas is often well tolerated and may not give rise to symptoms. Europeans escape infection.

The intermediate host of the parasite is *Physopsis africana*. Some 5 per cent. of snails of this species collected in endemic areas produced cercariae of the human type. *Bulinus senegalensis* (which was classified as *B. forskali* or *B. dautzembergi* by some malacologists consulted) was not found infected in natural conditions. *Norman White*

Schwetz, J. Sur l'immunité clinique dans les bilharzioses humaines. [**Immunity in Human Schistosomiasis**] *Bull. Soc. Path. Exot.* 1956, Jan.–Feb., v. 49, No. 1, 52–6.

Varying degrees of immunity to reinfection have been recorded in Rhesus monkeys after infection with *Schistosoma mansoni* and *S. japonicum*, though in one experiment immunity did not follow *S. mansoni* infection in baboons. There is doubt as to whether material immunity follows a schistosomal infection in man. The author suggests that though a primary infection of man does not prevent reinfection it confers tolerance to further light infections acquired at well-spaced intervals, though not to heavy repeated reinfections. This " premunition " is more evident in *S. haematobium* schistosomiasis than in that due to *S. mansoni* or *S. intercalatum*. *A. R. D. Adams*

di Egidio, M. Quadri radiologici della bilharziosi urinaria nello Yemen. [**Radiological Picture of Urinary Schistosomiasis in the Yemen**] *Arch. Ital. Sci. Med. Trop. e Parassit.* 1956, Apr., v. 37, No. 4, 165–85, 16 figs. [35 refs.] English summary.

The author mentions that infection with *Schistosoma haematobium* is widespread in the Yemen, and by radiology in 10 cases shows the extensive damage done not only to the bladder but also to the ureters and the renal pelves (hydro-ureter and hydronephrosis). He states that the picture of vesical schistosomiasis is characteristic, giving more or less regular filiform, ribbon-shaped, or band-like striae outlining the bladder contours, which cannot be confused with anything else except possibly the very rare partially calcified wrinkled bladder caused by tuberculosis. The hydro-ureter and hydronephrosis are considered to be due to a " dynamic " cause.

Some very good radiographs show the extent of calculus formation and the calcification of the vesical walls, and pyelograms, both direct and retrograde, show the damage to the ureters and renal pelves.

The history was typical in all cases and ova were found in the urine of several. *W. K. Dunscombe*

Schwetz, J. Sur quelques faits et principes fondamentaux de la bilharziose intestinale à *Schistosoma mansoni*. [**Some Fundamental Facts and Principles in Intestinal** *S. mansoni* **Infection**] *Bull. Soc. Path. Exot.* 1956, Jan.–Feb., v. 49, No. 1, 143–50, 4 figs. on pl.

Commenting on the symposium on schistosomiasis held at Léopoldville [this *Bulletin*, 1955, v. 52, 988] the author restates some of his own views on what he believes to be the fundamentals of schistosomiasis. The clinical severity of Mansonian schistosomiasis varies with local conditions; in some areas it is negligible, but in others it is very severe, with enlargement of the spleen and liver and ascites. The aetiology of this enlargement of the liver has not yet been clearly determined; in some cases there is cirrhosis and in others a simple sclerosis. The term " intestinal schistosomiasis " is a clinical one embracing infections due to either *Schistosoma mansoni* or to *S. intercalatum*, while " urinary schistosomiasis " is confined to *S. haematobium* infection. The occasional discovery of an egg of the latter parasite in the rectum does not alter this fact. *A. R. D. Adams*

Pessoa, S. B., da Silva, L. H. P. & Costa, L. Observações sôbre a epidemiologia da esquistossomose no estado da paraíba. [**Observations on the Epidemiology of** *Schistosoma mansoni* **Infection in the State of Paraíba**] *Rev. Brasileira Malariologia*. Rio de Janeiro. 1955, Apr., v. 7, No. 2, 305–10. English summary (10 lines).

In 1953 Pessoa and Barros pointed out that figures representing the percentage of a community found harbouring ova of *Schistosoma mansoni* by examination of the faeces provide an insufficient index of the intensity of schistosomiasis prevalence (*Rev. Med. e Cirurgia de São Paulo*, 1953, v. 12, 147). Due regard must also be paid to the severity of the symptoms engendered by such infection. A recent survey carried out in a rural and in an urban area in the State of Paraíba, Brazil, showed that 40 per cent. and 26 per cent., respectively, of their populations harboured *Schistosoma*. The severity of the disease in the State of Paraíba is, however, much less than in the neighbouring State of Sergipe which was reported on in the previous communication mentioned above. No less than 24·5 per cent. of the infected in Paraíba were altogether free from symptoms of the disease, compared with only 7 per cent. in Sergipe. The macrocytic hypochromic anaemia characteristic of severe *Schistosoma* infections was much less in evidence in the Paraíba cases. Greater severity is probably due to more frequent and heavier re-infections. The authors consider that further epidemiological studies in areas where the manifestations of the disease are mild might suggest more efficient methods of control in severely infested areas. *Norman White*

Olivier, L. & Schneiderman, M. **A Method for estimating the Density of Aquatic Snail Populations.** *Exper. Parasit.* New York. 1956, Mar., v. 5, No. 2, 109–17.

A review is made of techniques already employed for the sampling of fresh-water snail populations and estimation of their density. Another method is described. This method was devised during the study of the vectors of *Schistosoma mansoni* in Brazil and was confined to the collection of *Tropicorbis centimetralis*. Evaluation of the method was made with the molluscan population of 4 selected pools.

Collections are made over marked areas where one or more experienced collectors, using sieves or other devices, dip the marked area systematically and uniformly for a measured length of time. The snails collected are placed in collecting cans. The collecting time varies between 10 and 30 minutes according to whether the snails are numerous or scarce. At the end of the period the snails are counted and then returned to the area from which they were collected. Repetition of the procedure, during successive days, in the same area by the same collectors and equipment provides records for comparison.

In the pools studied, 6 or 7 collections were made in each pool over a period of 7–9 days by 2 or 3 collectors. For the most part the collections were made on succeeding days and the collecting time was 10 minutes. Statistical analysis was made of the results to obtain the degree of experimental error that might be expected. It is concluded that a single collection can provide a reasonably reliable estimate of the snail density; that the reliability is improved by increased collecting time and by repeated collections from the same place. It was found that the variation between snail counts made simultaneously by 2 men in the same area was much greater than the day-to-day variation for 1 man. The chief limitations of the method are related to the ability of the snails to move away from or into the selected area and the variation in skill and conscientiousness of the collectors.

It is considered that, if used with care, the method can prove useful for comparing snail population densities in relation to molluscicide trials or to seasonal variation in limnological conditions. *O. D. Standen*

de Andrade, R. M., Santos, I. N. & Oliveira, R. Contribuição para o conhecimento dos criadouros de planorbíneos, na área do Distrito Federal: I. Variação de diferentes fatôres químicos de suas águas. [**Observations on Breeding Places of Planorbids in an Area in the Federal District, Brazil. I. Variation in Different Chemical Factors in the Waters**] *Rev. Brasileira Malariologia.* Rio de Janeiro. 1955, Jan., v. 7, No. 1, 103–30. English summary.

With the aim of adding to the knowledge of the ecology of snail populations in relation to the epidemiology of schistosomiasis the authors

undertook chemical analysis of 100 samples of water taken from 14 administrative areas in the Federal District of Brazil. *Australorbis immunis* and *A. tenagophilus* are known to breed locally; most of the breeding places were ditches (77) or artificial depressions (11); the remainder were natural depressions, wells and swamps.

Quantitative determinations were made of chlorides, sulphates, phosphates, nitrates, nitrites, ammonia, iron, calcium, magnesium, hardness, acidity or alkalinity due to bicarbonates or carbonates, and *p*H.

The results are shown in great detail, in terms of maximum, minimum and average findings for each area, and type of breeding place: a separate table lists these data for each chemical factor determined. The tables should be studied for analysis of the results, but it is clear that there was considerable local variation in the chemical composition of the different water samples. *H. J. O'D. Burke-Gaffney*

Paraense, W. L. & Deslandes, N. **Studies on** *Australorbis centimetralis*. **II: Biospecific Characterization. III: Generic Status.** Reprinted from *Rev. Brasileira Biologia*. 1955, Dec., v. 15, No. 4, 341–8. [15 refs.]

Previously, the authors offered morphological differences as evidence for the separation of *Australorbis centimetralis* from *A. glabratus* and *A. nigricans* [see also this *Bulletin*, 1956, v. 53, 610]. This paper describes the results of laboratory experiments in interbreeding where albino *A. glabratus* and albino *A. nigricans* were confined, respectively, with pigmented *A. centimetralis*. Eggs from the albino *glabratus* and *nigricans* produced albino offspring exclusively while the $F_1$ and $F_2$ generations from each *centimetralis* consisted of pigmented specimens only. It is concluded that reproductive isolation exists between the species in addition to the morphological differences.

A detailed discussion of the morphological characters of *centimetralis* is presented in an endeavour to determine whether this species should be allocated to the genus *Australorbis* or *Tropicorbis*. It is concluded that sufficient similarity exists to include *centimetralis* with *Australorbis* and that the exact meaning of the generic name *Tropicorbis* is open to doubt. *O. D. Standen*

Schwetz, J., Fort, M. & Baumann, H. Sur le problème d'une infection uni- ou bisexuée transmise par les cercaires de *Schistosoma* émises par un seul Mollusque. [**The Problem of Unisexual or Bisexual Infection transmitted by Schistosome Cercariae emitted by a Single Snail**] *C.R. Soc. Biol.* 1955, Nov., v. 149, Nos. 21/22, 2026–2, 1 fig.

The authors' summary in French is freely translated as follows:—

The results of different comparative experiments show that cercariae emitted by a single planorbid snail, either naturally infected or experimentally infected, without regard to the number of miracidia to which

it was exposed, may produce unisexual or bisexual infections in the mice exposed; but generally if not regularly, unisexual male infections result. This applies both to *S. mansoni* and *S. rodhaini*. *J. J. C. Buckley*

Fraga de Azevedo, J. & Monteiro da Costa Faro, M. Différence dans la susceptibilité de quelques espèces de *Planorbis* à l'infection par le *Schistosoma mansoni* de Mozambique. [**Difference in Susceptibility of *Planorbis* of Different Species to Infection by a Mozambique Strain of *Schistosoma mansoni***] *C.R. Soc. Biol.* 1955, Oct., v. 149, Nos. 19/20, 1848–51.

The authors' summary in French is freely translated as follows:—

We attempted to infect *Australorbis glabratus* from Brazil, *Planorbis dufourii* and *Biomphalaria pfeifferi* from Sud du Save, and *Helisoma duryi*, with eggs of *Schistosoma mansoni* from Sud du Save—a strain maintained experimentally in the monkey, *Cercopithecus aethiops rufoviridis*. The same technique was used throughout. Only the *B. pfeifferi* proved susceptible to the infection; the other 3 species of snails were always refractory. *J. J. C. Buckley*

da Silva, L. H. P., Pessoa, S. B. & Costa, L. Sôbre o valor de um único exame de fezes para avaliação da incidência da esquistossomose mansônica em zona endêmica. [**The Value of a Single Examination of Faeces in determining the Incidence of *Schistosoma mansoni* Infection in Endemic Zones**] *Rev. Brasileira Malariologia*. Rio de Janeiro. 1955, Jan., v. 7, No. 1, 181–8. [11 refs.] English summary.

In a rural district (Mandacaru) in the State of Paraíba, Brazil, the authors had found that 8·7 per cent. of children under 9 years and 33·1 per cent. of persons over 10 were infected with *Schistosoma mansoni*, as judged by a single examination of stools by sedimentation. They therefore examined 67 persons over 10 years who had been negative in that study, by means of 4 additional stool examinations at intervals of not less than 3 days, followed by an intradermal test with schistosomal antigen. The incidence now increased from 33 to 73 per cent. In the case of other common intestinal helminths the index of infection increased by about 50 per cent. In addition to providing this evidence of the inadequacy of a single stool examination for estimating incidence, the authors point out that for comparison of incidence rates in different localities in endemic areas where the disease has existed for a long time, it is necessary to examine groups of the population who are homogeneous in respect of their probable degree of exposure to infection.

*H. J. O'D. Burke-Gaffney*

Baldó, J. I. Manifestaciones pulmonares de la Bilharziosis. [**Pulmonary Manifestations of Schistosomiasis**] *Rev. Sanidad y Asistencia Social.* Caracas. 1953, Jan.–Apr., v. 18, Nos. 1/2, 147–61, 5 figs. on 5 pls. [10 refs.]

After a discussion of the general problem of pulmonary manifestations of schistosomiasis the author describes a study of their incidence and significance. This was undertaken in (a) a group of persons in a rural area in Venezuela (San Casimiro), a highly endemic area of schistosomiasis, and (b) city-dwellers referred to the schistosomiasis clinic in Caracas for treatment because of having *Schistosoma mansoni* in their stools. In group (a) those were chosen mainly who were under 20 years of age: in group (b) most of the patients were aged 10 to 39 years. In group (a) 179 X-ray examinations were made and in group (b) there were 81: of the latter only 27 patients had completed a full course of treatment.

The results are tabulated. The principal findings were abnormal shadows in the lung field (26·8 per cent.), some cardiac enlargement (15·6 per cent.), and solitary micronodules (6·0 per cent.) in group (a), while in group (b) the shadows were seen in only 3·7 per cent. while nodules of about 3 mm. in diameter were seen in 9·9 per cent. Full details are given of 2 patients in whom generalized micronodules were found and who showed marked clinical features of schistosomiasis.

The author concludes that respiratory manifestations are common in the invasive stage of schistosomiasis and may be detected radiologically. He regards the generalized micronodular picture as being extremely rare.

*H. J. O'D. Burke-Gaffney*

Pessoa, S. B., da Silva, L. H. P. & Costa, L. Sôbre a anemia na esquistossomose mansônica em zonas urbana e rural do Estado da Paraíba. [**Anaemia in Cases of *Schistosoma mansoni* Infection in an Urban and in a Rural Area in the State of Paraíba**] *Rev. Brasileira Malariologia.* Rio de Janeiro. 1955, July, v. 7, No. 3, 337–42. English summary.

In an urban and in a rural area in the State of Paraíba, Brazil, a comprehensive examination was made of the blood of 131 town dwellers and of 43 inhabitants of the rural area, all of whom harboured *Schistosoma mansoni*, revealed by faeces examination. A similar haematological study was carried out on a further group of 35 urban residents all of whom were free from *S. mansoni* infection as determined by 5 successive negative examinations of the faeces and negative response to intradermal injection of antigen of the adult worm. In the infected groups the anaemia was hypochromic macrocytic; anaemias in the control group were normocytic. The macrocytosis was more marked in the town dwellers than in the rural population, though the index of infection of the latter was 40 per cent. compared with 26 per cent. in the town.

*Norman White*

Radaody-Ralarosy, P. A propos de l'éosinophilie tropicale essentielle: l'éosinophilie dans la bilharziose (cinq observations familiales). [**" Essential " Tropical Eosinophilia; Five Familial Cases of Eosinophilia associated with Schistosomiasis**] *Bull. Soc. Path. Exot.* 1956, Jan.–Feb., v. 49, No. 1, 45–51.

The author, from Tananarive, discusses the frequency of eosinophilia in Madagascar, which he has found to be most marked in *Trichuris*, ankylostome and schistosome infections, separately or together. He reviews a number of cases and, in particular, gives a detailed account of 5 patients in one family whom he was able to follow up carefully for 4 years. They represented members of a party of 10 people who had bathed in a stream in an area about 296 km. south of Tananarive. Five of the affected persons developed a high eosinophilia (20 to 60 per cent.) and, although their stools were subsequently negative for 55 days to 3 years, eggs of *Schistosoma mansoni* were eventually found in 4 of them.

The author points to the need for careful and repeated stool examinations when high degrees of eosinophilia are found in areas where schistosome infection is suspected. He considers that the evidence gives support to the belief that " essential tropical eosinophilia " does not exist.

Deschiens, in discussion agreed that non-parasitic tropical eosinophilia is rare, but could not agree that " tropical eosinophilia " as described by Weingarten did not occur. The different points of view which exist were also referred to by Lavier. [See also this *Bulletin*, 1956, v. 53, 1029.]

*H. J. O'D. Burke-Gaffney*

Andrade, Z. A. & Guimarães, A. C. Síndrome de Budd-Chiari e esquistossomose mansonica. (Forma hepato-esplênica.) [**Budd-Chiari's Syndrome and *Schistosoma mansoni* Infection (Hepato-Splenic Form)**] *Bol. Hosp. Clin. Facul. Med. Univ. Bahia.* 1955, Nov., v. 1, No. 4, 18–32, 6 figs. [11 refs.]

The English summary appended to the paper is as follows:—

" Report deals on a fatal case of the Budd-Chiari's syndrome [endophlebitis obliterans hepatica] occurring in a 21 year old female patient, who also presented intense hepatic lesions from Manson's schistosomiasis. (Symmer's clay-pipe stem cirrhosis). It is discussed the relationship between the two pathological processes and it is suggested that the hepatic vein thrombosis was secondary to hepatic schistosomiasis."

Bellon, J. Essai de traitement de la bilharziose intestinale par l'Oxyde Stanneux. [**Trials of Stannous Oxide in the Treatment of Intestinal Schistosomiasis**] *Bull. Méd. de l'Afrique Occidentale Française.* 1955, v. 12, 35–9.

See this *Bulletin*, 1954, v. 51, 1174.

Paulini, E. Método colorimétrico para a determinação de cobre em criadouros de planorbídeos. [**Colorimetric Method for estimating Copper in Breeding Places of Planorbids**] *Rev. Brasileira Malariologia.* Rio de Janeiro. 1955, Apr., v. 7, No. 2, 273–5. English summary (5 lines).

For field tests in areas where copper derivatives are employed as molluscicides, the author used the pyridine-thiocyanate reaction for estimating very small quantities of copper.

By the preparation of colour standards, the test could be carried out easily and rapidly in the field and concentrations of copper sulphate as low as 2 p.p.m. could be estimated colorimetrically. The preparation of the colour standards and the technique used by the author are described.

*H. J. O'D. Burke-Gaffney*

Paulini, E. Um dispositivo simples para a aplicação de moluscocida líquido. [**A Simple Apparatus for applying Molluscicides in Solution**] *Rev. Brasileira Malariologia.* Rio de Janeiro. 1955, Apr., v. 7, No. 2, 277–9, 1 fig. English summary.

This apparatus, which is illustrated in a drawing, consists of an ordinary wooden barrel, closed at the bottom by means of a rubber stopper, through which pass 2 short glass tubes. One of these is a capillary tube of 1 mm. diameter for air intake, the other is 4 to 8 mm. in diameter and serves as an outlet for the solution. The rate of flow of the molluscicide solution is controlled by a clamp on a short rubber tube attached to the air inlet.

The advantages claimed for this device are the cheapness and ubiquity of the materials, the simple construction and the reliable performance which does not require constant supervision.

It is added that in an emergency, the glass tubes may be dispensed with, and reliance placed on the stopper with bores of different diameter.

*H. J. O'D. Burke-Gaffney*

Perlowagora-Szumlewicz, Alina & de Oliveira Dias, G. Experiências de laboratório sôbre a possibilidade de os planorbídeos viverem dentro da lama ou nela se enterrarem na ocasião do tratamento com planorbicidas. [**Laboratory Studies on the Possibility that Planorbids live in Mud or bury Themselves there during Treatment with Planorbicides**] *Rev. Brasileira Malariologia.* Rio de Janeiro. 1955, July, v. 7, No. 3, 375–83. English summary.

In a study of the problem set out in the title and of the influence of the softness and depth of the mud, the authors buried specimens of *Australorbis immunis* in mud taken from infested waters. The snails

were kept for 24 to 48 hours at depths from 2 to 8 cm. below the surface of mud saturated with water ranging in amount from 25 to 49 per cent. The results, shown in tables, indicate that at the end of this period all the buried snails had died, irrespective of the depth of mud and degree of saturation: a few which crawled out of the mud during the experimental period escaped, but others died soon after being transferred to fresh water.

These results suggest that it is doubtful whether, under natural conditions, snails can live long under mud, and that if they do survival is restricted to those which can escape or be uncovered shortly after entering the mud. Possibly some of these could re-infest a treated area, but might on the other hand be killed on the surface by the residual action of planorbicides which could not reach them deeper down.

To test this, snails were placed in glazed basins filled with mud to 6–7 cm., overlaid with water to a depth of 4 cm. Next day sodium pentachlorophenate and copper sulphate in concentrations of 5 to 20 p.p.m. were applied and the snails observed for 48 hours. No snails penetrated the mud at any time, even when it was soft and fluid.

Concurrently, snails were buried artificially to a depth of 4 cm. in mud and the water was treated: a few snails emerged and were alive at 48 hours, but all those still buried were dead: nevertheless, similar results were obtained when the water was not treated. Evidently the chemicals at these concentrations did not prevent snails from crawling out of the mud.

The authors conclude that doubt is thrown on the suggestion often expressed that snails may penetrate the soil to protect themselves from molluscicides. *H. J. O'D. Burke-Gaffney*

Perlowagora-Szumlewicz, Alina & Dias, G. de O. Experiências sôbre a rapidez da ação moluscocida do sulfato de cobre e pentaclorofenato de sodio êm relação ao contacto e à concentração. [**Experiments to determine the Minimum Period of Contact required to kill *Australorbis* Snails by Various Concentrations of NaPCP and $CuSO_4$**] Reprinted from *Rev. Brasileira Med.* Rio de Janeiro. 1955, May, v. 12, No. 5, 295–303, 1 graph. [12 refs.] English summary.

The following is an extract from the English summary appended to the paper:—

"From a comparison of data summarised in Tables 1 and 2, it is concluded that $CuSO_4$ in tap water poisons snails more rapidly than NaPCP [sodium pentachlorophenate] under like conditions. The rapid toxic action of $CuSO_4$ may be of great importance for use in natural water, where treated snails could be swept into nearby untreated water by wind currents, by humans and animals, and where the water-soluble molluscacides may be lost quickly by natural and artificial run-off. It is suggested

that possibly under certain conditions, where it is difficult to maintain low concentrations of chemicals for long periods of time, the application of high concentrations of $CuSO_4$ for short periods might be more effective and less expensive than the use of NaPCP. However this can be established by field tests only."

Perlowagora-Szumlewicz, Alina. Experiências de laboratório sôbre o efeito planorbicida residual do pentaclorofenato de sódio e do sulfato de cobre. [**Laboratory Experiments on the Residual Planorbicidal Effect of Sodium Pentachlorophenate and Copper Sulphate**] *Rev. Brasileira Malariologia*. Rio de Janeiro. *Publicações Avulsas No. 2.* 1955, Oct., 19 pp., 1 fig. [16 refs.] English summary.

"Experiments were made to determine the comparative efficacy of NaPCP and $CuSO_4$ with special reference to the length of time the molluscacidal residues continued to kill snails."

The experiments were carried out under laboratory conditions with basins containing water and mud from *Australorbis immunis* habitats. The chemicals were tested in concentrations ranging from 2 to 25 parts per million (p.p.m.). Groups of 20 snails each, were introduced into each basin and at the end of 5 days, if all the snails in a basin were killed a new group was introduced and so on until more than one snail survived more than 5 days. At concentrations of 15, 20 and 25 p.p.m. of NaPCP control was effected for 90, 97 and 114 days respectively, indicating a long residual effect though the toxicity of the chemical diminished with time. At lower concentrations, *e.g.*, 2 p.p.m., the residual effect of the chemical was inhibited by the mud suspended in the water.

With $CuSO_4$ the residual effect was short-lived. At 2 to 5 p.p.m. it was only about 3 days and at 10, 15, 20 and 25 p.p.m. the effectiveness of this chemical disappeared between the 4th and 7th day.

With both chemicals two different types of mud were used in the experiments, giving similar results, and it is observed that further tests with other types of mud are needed before a fair conclusion can be obtained. However, it appears that NaPCP is preferable to $CuSO_4$ where residual effects are required. *J. J. C. Buckley*

Perlowagora-Szumlewicz, Alina & de Oliveira Dias, G. Experiências de laboratório sôbre a durabilidade da ação moluscocida de alguns compostos químicos. [**Laboratory Studies on the Persistence of Molluscicidal Action of Some Chemical Compounds**] *Rev. Brasileira Malariologia*. Rio de Janeiro. *Publicações Avulsas No. 3.* 1956, Jan., 16 pp. [14 refs.] English summary.

Recent field trials of molluscicides have shown that a satisfactory compound for control schemes has not been developed. One of the

problems frequently encountered is that treatment of a body of water during the dry season, when it is most accessible and when the concentration of snails is at its greatest, results only in a temporary reduction in the population. During the subsequent wet season aestivating snails remaining around the banks of the water are washed back into it and are able to re-establish the population. The obvious need is for a molluscicide with a residual lethal activity similar to that of some of the modern insecticides. With this in view the authors have investigated the durability of 5 compounds. Of the natural factors affecting the efficiency of molluscicides (mud, sunlight, temperature, *p*H, vegetation, etc.) the authors have chosen mud as the one on which to base their investigations.

The snails used were *Australorbis immunis* and mud from their natural habitats was used for the experiments. The compounds tested were: copper oxychloride ($CuCl_2.3CuO.4H_2O$), Pechiney Progil (trade name, Virico-50); copper pentachlorophenate, Monsanto; benzene hexachloride paste containing 15 per cent. gamma isomer; pentachlorophenol emulsifiable oil (15 per cent.), Shell; colloidal copper, Duphar-Philips, containing 20 per cent. metallic copper. Experiments were carried out in glazed earthenware containers of 10 litres capacity lined with mud, each containing 4 litres of water, 20 snails and lettuce leaves. Four containers for each compound were used, a control and one each at concentrations of 10, 15 and 20 parts per million of molluscicide. Parallel experiments to check the deterioration of the compound due to mud were made in crystallizing dishes of 2 litres capacity with 10 snails in each and no mud. The durability of the molluscicidal effect of a compound was estimated from the number of days during which the solution retained the power to kill, after a contact of 96 to 120 hours, 95 per cent. to 100 per cent. of the snails placed in it. As soon as the snails of one batch were killed they were removed and 20 others (or 10 in the plain water experiments) were added. In the case of experiments of long duration the concentration of the solution was maintained by the addition of fresh water to the original level.

The results of these experiments are tabulated in the paper and discussed adequately in the English summary. It should, however, be mentioned that the emulsifiable oil of pentachlorophenol was found to be the only one of the compounds tested which was unaffected by the presence of mud. It showed a residual action for 2 to 3 months in concentrations of 10 to 20 p.p.m. in water, irrespective of whether mud was present. The authors suggest, however, that field trials with benzene hexachloride pastes and colloidal copper compounds in addition to the pentachlorophenol oil may be justified. They add that their new BHC paste appears to be an outstanding molluscicide, superior to the powder formulation because of its physical properties: they have reason to believe that it might have a lethal action persisting as long as that of the pentachlorophenol oil. *Christopher A. Wright*

Halawani, A. & Latif, N. **B-Nitrostyrene: a Snail and Insect Poison.** (A Preliminary Report.) *J. Egyptian Med. Ass.* 1955, v. 38, No. 12, 727–9.

In molluscicidal tests with β-nitrostyrene, it was found that, in concentrations of 10 p.p.m. in tap-water, planorbid snails sank to the

bottom immediately, retracted far into the shells and remained stationary until death occurred within 24 hours. This effect was also observed in greater [unstated] dilutions. β-nitrostyrene proved lethal to cercariae within 5 minutes at a concentration of 5 p.p.m.

The same chemical was found to possess insecticidal properties for the adults and larvae of *Culex pipiens* and for *Pediculus humanus*, but was not effective against *Cimex lectularius* or *Musca vicina*. *O. D. Standen*

Schwetz, J. Sur les lésions hépatiques des rats sauvages naturellement infectés de *S. mansoni* var. *rodentorum* (et de *S. rodhaini*). [**Hepatic Lesions in Wild Rats Naturally Infected with** *S. mansoni* **var.** *rodentorum* **and with** *S. rodhaini*] *Ann. Soc. Belge de Méd. Trop.* 1956, Feb. 29, v. 36, No. 1, 105–11. [10 refs.]

The author discusses, with reference to the findings of other workers in the past, the doubt which exists as to the histopathological nature of the liver enlargement in repeated infections by *Schistosoma mansoni*. Most of the studies have been made on experimentally infected animals and the present author now records investigations on the livers of 4 wild rats, 3 naturally infected with *S. mansoni* var. *rodentorum* [this *Bulletin*, 1954, v. 51, 72] and one naturally infected with *S. rodhaini*. He compared these with livers of 2 *Rattus rattus*, one infected naturally and one experimentally with *S. mansoni* [*ibid.*, 1956, v. 53, 217, 218]. The livers were examined by a histo-pathologist, Professor Pol Gérard. The results are tabulated and it is evident that in no case was a true cirrhosis present: the general picture was that chiefly of lymphocytic infiltration, localized to the portal spaces.

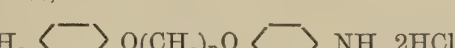
In discussion, the author points out that these enlarged livers are the result of old chronic repeated infections only. In experimental infections in animals, the infections are recent; but in naturally infected animals, a few old infections may be found and hence these are of more value in studying the problem. He adds, however, that the absence of cirrhosis in experimental animals does not prove its absence in human infections. Cirrhotic lesions in human *S. mansoni* infections cannot therefore be excluded from these experiments and their exact nature has yet to be determined.

In the meantime, to avoid confusion, the author suggests that in these cases the term " hypertrophic liver " would be preferable to " cirrhotic liver ". *H. J. O'D. Burke-Gaffney*

Hill, J. **Chemotherapeutic Studies with Laboratory Infections of** *Schistosoma mansoni*. *Ann. Trop. Med. & Parasit.* 1956, Mar., v. 50, No. 1, 39–48. [17 refs.]

The strain of *S. mansoni* was maintained in hamsters which were infected by intraperitoneal injection of cercariae. The cercariae were obtained from *Australorbis glabratus*. For chemotherapeutic tests mice were infected in the same way, and a few experiments were also made with rhesus monkeys. The compounds were given to the mice orally for 4 days, 15 mice being used in each group. The results of the treatment were judged by post-mortem examination usually carried out 7 or 14 days after the end of treatment. [For the other technical details the original paper should be consulted.]

The chief group of active compounds studied was the di-(*p*-amino-phenoxy) alkane series,



When n = 1, 2, or 10 the compound was inactive, but with other values for n considerable activity was observed. Action was more rapid than that of Miracil D which took 21 days to cause ensheathment of the worms in the liver. With M & B 968 A (n = 5) ensheathment was well advanced within 9 days. The peak of activity occurred when n = 6, 7 or 8; but when n = 6 the compound was more toxic, so the best therapeutic ratio was obtained when n = 8.

M & B 968A was also tried in 4 rhesus monkeys, 2 of which were given 0·2 mgm. per gm. and 2 were given 0·1 mgm. per gm. by mouth daily for 4 days, and later 0·5 mgm. per gm. parenterally twice daily for 4½ days. Slight therapeutic activity was observed. However, all 4 treated monkeys showed temporary visual disturbances, and by the fourth day of oral treatment they seemed to have difficulty in seeing or focussing upon small pieces of food thrown to them. [This series of compounds is the same as that described by Raison and Standen (this *Bulletin*, 1955, v. 52, 997). It possesses considerable schistosomicidal activity, but its therapeutic use is handicapped by the toxic effects upon the eyes.] *F. Hawking*

Ito, J. **Studies on Hatchability of** *Schistosoma japonicum* **Eggs in Several External Environmental Conditions.** *Japanese J. Med. Sci. & Biol.* 1955, Apr., v. 8, No. 2, 175–84, 1 fig.

This paper is an account of investigations made of the effects of environmental factors such as temperature, salinity, desiccation and

prolonged immersion in urine and faeces upon the viability of eggs of *Schistosoma japonicum* obtained from the faeces of an experimentally infected rabbit.

The optimal temperature for hatching of the eggs was found to be 13°–28°C. The lower and upper limits of temperature at which some hatching occurred were 3° and 33°C. No hatch was obtained at 0° and 38°C. At optimal temperatures the eggs continued to hatch over 3–5 days, but about 50 per cent. of the miracidia emerged in the first 24 hours. The exposure times required to kill all the eggs at temperatures outside the hatching range were: 60°C., 1 sec.; 55°C., 3 min.; 50°C., 1 hour; 45°C., 8 hours; 38°C., 19 days; 3°C., 370 days; 0°C., 81 days; −10°C., 4 hours; −20°C., 1 hour.

*S. japonicum* eggs exposed to 0·2, 0·5, 0·8 and 1·0 per cent. saline showed no reduction in hatchability between the control and 0·2 per cent. concentration but the emergence time was prolonged in the saline solution. At 0·5–1·0 per cent. the hatching rate was progressively reduced and the hatching period extended. In 1·0 per cent. saline the hatching rate was only 1·8 per cent. of the control. The effect of immersion in higher concentrations such as 2·0, 3·0 and 4·0 per cent. saline for 24 or 72 hours, prior to washing in fresh water, was to reduce the hatch rate markedly. Immersion in 4·0 per cent. saline killed all the eggs.

Desiccation of faeces at 28°C. rapidly reduced the viability of the eggs. At 8 hours only 9·6 per cent. hatched, and desiccation for 72 hours killed all the eggs.

After prolonged immersion in wet rabbit faeces all eggs were non-viable in 20 days at 28°C. but the time of survival increased greatly with reduction in temperature. Prolonged exposure to urine at 28°C. killed the eggs more rapidly, but again the survival rate increased with reduction in temperature. *O. D. Standen*

Fain, A. Sur une furcocercaire du group " Ocellata " produisant expérimentalement la " dermatite des nageurs " à Astrida (Ruanda-Urundi). [**A Furcocercaria of the " Ocellata " Group experimentally producing Swimmers' Itch at Astrida, Ruanda-Urundi**] *Ann. Soc. Belge de Méd. Trop.* 1955, Dec. 31, v. 35, No. 6, 701–7, 1 fig.

The author's summary in French is freely translated as follows:

The author describes a new furcocercaria of the " Ocellata " group, *Cercaria herini* n. sp. from a lymnaeid snail *Lymnaea natalensis undussumae* von Martens, at Astrida.

When placed on the skin of a European volunteer these cercariae produced experimental dermatitis accompanied by violent pruritus, similar to the condition known as " swimmers' itch ".

The author thinks that this new cercaria is the larval stage of one of

the 8 species of *Trichobilharzia* which he described recently at Ruanda-Urundi. *J. J. C. Buckley*

Gallais, P., Paillas, P., Collomb, P., Luigi, D. M., Demarchi, J. & Deschiens, R. Étude anatomo-pathologique d'un kyste parasitaire cérébral observé chez l'homme. [**Anatomo-Pathological Study of a Cerebral Parasitic Cyst in Man**] *Bull. Soc. Path. Exot.* 1955, v. 48, No. 6, 830–32, 4 figs. on 2 pls.

A cyst, 6–7 mm. in diameter, was removed surgically from cerebral tissue of a man aged 40 who showed signs of epilepsy: he had served in the Far East. On sectioning, the cyst was seen to be composed of an outer envelope of dense connective tissue in direct contact with the nervous tissue; a thick degenerating zone composed of remains of leucocytes and other cells; a central mass of organized tissue, 2 × 1 mm. in size, also in course of degeneration, but containing well preserved eggs measuring 18 × 15 $\mu$. The central mass is believed to be a parasitic trematode and all the evidence points to its belonging to the genus *Heterophyes*. From the same patient a subcutaneous cyst had previously been removed from the axillary region; it contained unidentified helminth eggs. The patient had also had eye trouble and a whitish foreign body, thought to be a cysticercus, had been observed in the aqueous humour.

This appears to be the first record of an adult trematode in a cerebral cyst in man. *J. J. C. Buckley*

Buck, A. A. & Uhrmann, G. Untersuchungen über den Befall mit *Echinostoma lindoense* und *Schistosoma japonicum* bei der Bevölkerung des Lindusees (Mittelcelebes). [**Investigations on the Incidence of Infection with** *Echinostoma lindoense* **and** *Schistosoma japonicum* **in the Population near Lake Lindus (Central Celebes)**] *Ztschr. f. Tropenmed. u. Parasit.* Stuttgart. 1956, v. 7, No. 1, 110–16, 4 figs.

An investigation of the public health was carried out in the Palu District of Central Celebes, near Lake Lindus, an area untouched by medical services. It was known, however, that *Schistosoma japonicum* and *Echinostoma lindoense* occurred. This district is very isolated. It contains 600–700 people living in 3 villages of whom about one-quarter (158) were examined. Of these 37–41 per cent. showed hepatosplenomegaly, 17 per cent. showed swelling of the spleen alone and 2–5 per cent. swelling of the liver alone. Only 35–44 per cent. were without enlargement of spleen or liver. Only 2 cases of infection with *Plasmodium falciparum* and 2 with *P. vivax* were found. In the 3 villages the average

haemoglobin values were 60–62 per cent.; 42–85 per cent. of the stools contained ova of *E. lindoense*, 22–32 per cent. ova of *S. japonicum*, 32 per cent. ova of *Ancylostoma* and 7–14 per cent. contained ova of *Ascaris*.

A description is given of *E. lindoense* [this *Bulletin*, 1941, v. 38, 383] which is a trematode 13–15 mm. long and 2·5–3 mm. broad. Man is the main host, while the intermediate host is the snail *Anisus sarasinorum*. The cercariae penetrate into the fresh-water mussel *Corbicula lindoense*, or into a snail *Viviparus javanicus*. People become infected by eating uncooked mussels. Carriers of these worms often suffer from eosinophilia, body pains and non-bloody diarrhoea. Carbon tetrachloride is an effective treatment, but is toxic. Hexylresorcinol seems to be ineffective. The intermediate host of *S. japonicum* in this region is still unidentified. It is considered that the hepatosplenomegaly may be due to the schistosomiasis and the anaemia to the ankylostomiasis. The infrequency of infection with *Ascaris* may be due to an antagonism by *Echinostoma* or (more simply) to the geographical isolation of this district.

*F. Hawking*

Osimani, J. J. & Peyrallo, R. Segundo caso de esparganosis encontrado en América del Sur. Primer caso descrito en el Uruguay. [**Second South American Case of Sparganosis, the First Recorded in Uruguay**] *Archivos Uruguayos de Med., Cirug y Especialidades.* 1954, Mar.–Apr., v. 44, Nos. 3/4, 139–47, 2 figs. [16 refs.]

The English summary appended to the paper is as follows:—

"The actual state of our knowledge of human sparganosis in the American continent is here exposed; so is the species of sub-genus Spirometra, found in their larval (Sparganum) or in their adult form in animals of this part of the world.

"The first case of human sparganosis in Uruguay, corresponding to the second South American case, is here described.

"On opening an abscess on the right leg of a patient, the larva was found. The patient was a woman who had never gone out of the country.

"The lesion healed and after ten months the patient showed no signs of other larval localization.

"Although the adult (only means of specifical identification of plerocercoid) was not obtained experimentally, everything leads us to believe that it belongs to *Diphyllobothrium decipiens*, if this may be accepted as a valid species."

Náquira, F. Cisticercosis múltiple. [**Multiple Cysticercosis**] *Bol. Chileno de Parasit.* 1955, Oct.–Dec., v. 10, No. 4, 80–81, 2 figs. English summary (7 lines).

Tálice, R. V. & Pérez-Moreira, L. Un caso de localización de *Taenia saginata* en la vesícula biliar. [**A Case of *Taenia saginata* Infection Localized in the Gall Bladder**] *Archivos Uruquayos de Med., Cirug. y Especialidades.* 1954, May–June, v. 44, Nos. 5/6, 261–9, 6 figs. English summary (4 lines).

Peraita, P. & Anastasio, J. V. Hidatidosis espinal. [**Spinal Hydatid Disease**] *Cirugía.* Madrid. 1956, Jan.–Mar., v. 2, No. 7, 56–73, 11 figs. English summary.

An account of 4 cases and discussion.

Sapriza, J. P., Rímini, R., Duomarco, J. L. & Surraco, G. H. Dos casos de quiste hidático de la aurícula derecha. Diagnóstico angiocardiográfico—Cura quirúrgica. [**Two Cases of Hydatid Cysts of the Right Auricle, diagnosed by Angiocardiography and treated Surgically**] *Archivos Uruguayos de Med., Cirug. y Especialidades.* 1954, Mar.–Apr., v. 44, Nos. 3/4, 148–56, 3 figs. [22 refs.] English summary (4 lines).

Sapriza, J. P., di Bello, R., Rímini, R., Roglia, J. L., Curbelo Urroz, J. R., de Fuentes, J. & Giambruno, C. E. Una observación de pericarditis hidática aguda. Estudio anatomopatológico realizado por el B. R. García. [**A Case of Acute Hydatid Pericarditis**] *Archivos Uruguayos de Med., Cirug. y Especialidades.* 1954, Oct.–Nov.–Dec., v. 45, Nos. 4, 5 & 6, 133–47, 11 figs. [12 refs.]

di Bello, R. El hidatidopericardio. [**The Hydatidopericardium**] *An. Facul. de Med. Montevideo.* 1955, Nov.–Dec., v. 40, No. 6, 244–59, 9 figs. [37 refs.] English summary.

A review of 13 cases in the literature and 4 personal observations.

Neghme, A., Rivera, G. F. & Alvarez, M. Algunas zoonosis parasitarias en perros vagos de la ciudad de Santiago. [**Parasitic Zoonoses in Stray Dogs of Santiago City**] *Bol. Chileno de Parasit.* 1955. Oct.–Dec., v. 10, No. 4, 73–5.

The English summary appended to the paper is as follows:—

" The authors examine 1,044 stray dogs caught in the city of Santiago. Of these, 36 were caught on the grounds of the Municipal Slaughter House while 1,008 were captured in the streets of the city.

"Of the first group, 10 dogs or 27%, harbored in their intestines the tapeworm *Echinococcus granulosus*, and 26 or 72%, had in the diaphragm cysts of *Trichinella spiralis*.

"The second group showed 45 dogs, or 4·6%, infected with *Taenia echinococcus*. 75 animals of this group were examined for *T. spiralis*; of these, 3 (4%) had cysts in the diaphragm.

"In addition, data on the occurrence of other intestinal helminths are presented."

Figueroa M., H. & Aguilar, F. J. **The First Case of *Dipylidium caninum* found and identified in a Human Being in Guatemala.** *Amer. J. Trop. Med. & Hyg.* 1956, Mar., v. 5, No. 2, 269–71, 4 figs.

"The first human case of *Dipylidium caninum* in Guatemala is reported. Apparently oil of chenopodium was effective in expelling the worms. Now that this case is being reported, more are likely to be found."

Heinz, H. J. **A Case of a Tetrarhynchid (Cestode) Infection in Man.** *Rev. Ecuatoriana de Entom. y Parasit.* Guayaquil. 1954, Jan.–Apr., v. 2, Nos. 1/2, 227–30.

The parasite referred to in this article was observed by an African servant girl in Johannesburg when she was bathing a boy (aged 5) in the bathtub. The worm was said to have emerged from the anus and was alive when first seen. It proved to be a Tetrarhynchid larva [Class Cestoda, Order Trypanorhyncha] and was identified as *Dibothriorhynchus* sp. type *grossum*. It appears to be the first record of a cestode of this kind occurring in man. The source of infection is uncertain but was presumably from ingestion of undercooked fish (Teleost) in which these larvae are known to occur. *J. J. C. Buckley*

Cannavò, L. & Tigano, F. Clinica dell'Anchilostomiasi. [**Clinical Manifestations of Ankylostomiasis**] *Giorn. di Malattie Infettive e Parassit.* 1956, Apr., v. 8, No. 4, 125–32.

This is a clinical lecture by the Director and Assistant of the University of Messina Clinic for Tropical and Sub-Tropical Infective Diseases.

The authors point out that there is an extensive range of symptoms and signs, from those of patients carrying the worm without showing any particular evidence, to cases of "acute ankylostomiasis", but that even if the "carriers" appear to show no signs for many years some intercurrent event such as pregnancy or acute illness may then make the symptoms due to the helminth very evident.

In any case the biological cycle of the worm can give rise to all manner of signs in the human host such as: skin lesions which are particularly frequent, often with swelling of the cutis or subcutaneous tissues; general allergic manifestations; affections of the respiratory system, sometimes with haemoptysis; gastric lesions when there may even be an ulcer-like niche radiologically—which disappears after specific treatment; interstitial hepatitis with definite signs of liver deficiency which are alleviated by the administration of essential amino-acids as well as by specific treatment; action on the pancreas, which may be shown by alteration in the blood diastase and lipase; myocardial affections, which may be very serious and are perhaps more pronounced in *Necator* infections owing possibly to its more toxic effect; serious effects on the endocrine system, especially when the infection starts in infancy. The authors mention particularly the very serious effects in pregnancy with a hypochromic anaemia, and possibly hypothrombinaemia with the consequent risk of grave intra- and post-partum haemorrhage.

For the individual, specific treatment by the usual methods [doses not stated] together with strong supportive treatment, especially with salts of iron, *e.g.*, ascorbinate, gluconate, or saccharate, is advised. The authors are particularly concerned with the need for mass treatment, and for environmental sanitation, but they mention that having regard to the very wide spread of the disease in Italy, not only in Calabria but in some of the Sicilian provinces as well, the problem is a very large one especially as many of the women, who seem to be more often affected than men, work in the fields either in bare feet or not sufficiently protected.

[This paper deserves to be read in full. It will be interesting to see in a few years' time whether the new agricultural schemes now coming into being in Calabria (see *The Times* special articles, May 31 and June 1, 1956) have any marked effect in reducing the incidence of the disease.]

*W. K. Dunscombe*

Lie Kian Joe & Tan Kok Siang. **Helminthiasis of the Intestinal Wall caused by** *Ancylostoma duodenale*. *Documenta Med. Geograph. et Trop.* Amsterdam. 1956, Mar., v. 8, No. 1, 75–9, 8 figs. [11 refs.]

The authors discuss earlier literature on infections of the submucosa of the small intestine of Indonesians with worms identified as being *Ancylostoma duodenale* and *A. braziliense*, on similar infections in the serval with *A. paraduodenale*, and of the African lemur with *A. duodenale galagoi*. Because the last two species might occur in man also, it is important to make sure that the species found in the submucosa of the human small intestine are, in fact, *A. duodenale*. It is not sufficient to rely simply on the presence of 2 pairs of large teeth in the buccal capsule, but to consider other morphological details as well.

The authors discuss these details and conclude that the 11 additional cases of infection of the mucosa of the small intestine of man which they

have observed in Indonesia (8 in males, 3 in females, all aged 14 to 55), were, in fact, infections with *A. duodenale*. From observations made on *A. duodenale* collected from autopsies of patients without infection of the submucosa of the small intestine, the authors concluded that the statement that the length of the spicules of *A. duodenale* is 2 mm. must be qualified by their finding that a long worm may have *shorter* spicules than a short worm. In one worm, 8·37 mm. long, the spicules were 1·54 mm. long; in another, 6·97 mm. long, the spicules were 2·01 mm. long. The length of the spicules of *A. duodenale* varies from 1·52 mm. to 2·39 mm. The authors detected a difference between worms taken from the intestinal mucosa and those taken from the intestinal lumen.

Of 20 cases of infection of the mucosa of the small intestine in Indonesians 14 were with *A. duodenale*, 1 with *A. braziliense* and 5 with unidentified hookworms. In other countries infection of the intestinal mucosa appears to be rare, if it occurs at all. The authors found only 2 references to it. When a female worm invades the intestinal wall, she lays large numbers of eggs in the tissues and rhabditiform larvae derived from these have been found in the intestinal wall by the present authors. They have never, however, found filariform larvae and they think it possible that the filariform larvae may soon enter the blood in the intestinal wall and may thus be taken to the lungs and finally reach the intestine in the normal manner. If this were true auto-infection could occur and, because the eggs production of *A. duodenale* is considerable, auto-infection could be serious. Invasion of the intestinal wall by *Necator americanus* is not known. *G. Lapage*

Sáenz H., C., Cordero C., E., Lizano, Cecilia, Arguedas, J. & Chavarría, M. E. Clínica y terapéutica de la anquilostomiasis y de la tricocefalosis infantil. [**Clinical and Therapeutic Studies of Ankylostomiasis and Trichuriasis in Children**] *Rev. Biologia Trop.* San José, Costa Rica. 1955, Dec., v. 3, No. 2, 135–60. [23 refs.]

The English summary appended to the paper is as follows:—

"1. A study is presented of the frequency of infestation by *Ancylostoma duodenale* or by *Necator americanus* and by *Trichuris trichiura* in 2026 children leaving the Pediatrics Section of Hospital San Juan de Dios, San José, C.R. during the first four months of 1953.

"2. Of these children, 32·7 per cent were positive for one or both parasites, mixed infestation being quite frequent.

"3. The distribution of the parasites is analysed according to age and sex, including the degree of anemia when present.

"4. A study is made of 63 children under treatment at the Pediatrics Section of Hospital San Juan de Dios during 1954 and showing heavy uncinariasis and trichocephaliasis; the salient facts are analysed regarding clinical, hematological, and parasitological manifestation. Flocculation tests and blood protein values are also considered.

" 5. The various therapeutic procedures, including blood transfusions, ferrotherapy and the usual anti-helminthics, are discussed and evaluated."

HEMMING, G. R. **Respiratory Complications of *Ascaris* Infestation in Fiji.** *Med. J. Australia.* 1956, Mar. 24, v. 1, No. 12, 501–2.

The author noted that heavy infection with *Ascaris lumbricoides* was associated with high incidence of apparent asthma among Indian children in Suva, Fiji Islands. In 40 days he recorded 100 cases of *Ascaris* pneumonitis. Although the numbers of Indians and Fijians attending the clinic are about equal, all these cases were in Indians, except 2 in Fijians, but the author also found ascariasis commoner among the Indians. Examination of anaemic schoolchildren showed that, of 430 Indians examined, 63 harboured *Ascaris* and 111 had hookworms, the remaining 256 being without worms, while of 408 Fijians examined, 27 had *Ascaris* and 120 had hookworms, and 261 had no worms.

The author describes a typical case of *Ascaris* pneumonitis in a child aged 8, who had dyspnoea, cyanosis and fever, with severe cough and abundant sputum, the predominant cells in which were eosinophils. The blood, however, showed only 1 per cent. of eosinophils. Severe bronchospasm is the outstanding clinical sign.

Of the 100 patients examined, 80 had *Ascaris*, 2 had not, 2 were associated with *Ascaris* infections in the household and in 18 no conclusion could be drawn as to association with *Ascaris*. The highest incidence was in children aged 2 to 6 years. There was a tendency for several cases to occur in the same household. Only 1 of the 100 patients died, but there is, the author thinks, " a definite mortality rate amongst severe cases ". All but 2 of the 100 patients came from poor surroundings.

Patients with a high temperature were given full doses of penicillin with or without sulphonamide drugs. Some had adrenaline to relieve acute spasm. Ephedrine and an expectorant mixture were also used. After the acute symptoms had subsided, piperazine hydrate was used till local stocks ran out, when santonin was given. *G. Lapage*

ROGERS, R. A. **A Study of Eggs of *Ascaris lumbricoides* var. *suum* with the Electron Microscope.** *J. Parasitology.* 1956, Apr., v. 42, No. 2, 97–108, 14 figs. on 5 pls. [31 refs.]

FIELDS, D. N., SELLY, G. W. & GUICHERIT, I. D. **The Treatment of Ascariasis with Piperazine.** *Documenta Med. Geograph. et Trop.* Amsterdam. 1956, Mar., v. 8, No. 1, 80–84.

The authors studied the effectiveness of a single dose, not exceeding 3·5 gm., of piperazine hexahydrate against heavy *Ascaris* infections in

Surinam. They used an orange-flavoured syrup containing 100 mgm. per ml. of piperazine hexahydrate, which was given to 58 patients; and tablets, each containing 500 mgm. of the hexahydrate, which were given to 12 patients. The ages of the patients varied from 1·5 to 51 years, but there was no relation between the efficacy of the treatment and the patients' ages or weights. The doses in relation to their weights were: up to 8·5 kgm., 1·0 gm.; 8·6 to 22·75 kgm., 2·0 gm.; 22·76 to 45·4 kgm., 3·0 gm.; 45·5 kgm. and over, 3·5 gm. There were no dietary restrictions and purgatives were not given. Before treatment egg counts were done on the stools by the Stoll dilution method. Two faecal smears were taken from each patient 10 to 14 days after treatment. If no eggs were found in these the patient was considered cured. If eggs were found a Stoll dilution count was done.

A table of results shows that out of 56 patients given the syrup 38 were cured. Two patients not cured were given a second dose 2 weeks later and both were cured. Of the 12 patients given the tablets 8 were cured. Tables showing the ages and weights of the patients, the doses given and the results of the egg counts, show that there was, in the patients not cured by the syrup, a reduction of 89·7 per cent. in the egg count and, in those given the tablets a reduction of 68·1 per cent., or, as the authors claim, an overall reduction in these two groups of 94·3 per cent.

The single-dose treatment with this readily-accepted syrup is well adapted to mass treatment or to treatment in hospital clinics; it can be given at any time of the day, without dietary restrictions or purgatives or ill-effects, and it uses less of the drug than treatments that last longer.

*G. Lapage*

Winckel, W. E. F. & Treurniet, A. E. **Infestation with** *Lagochilascaris minor* **(Leiper) in Man.** *Documenta Med. Geograph. et Trop.* Amsterdam. 1956, Mar., v. 8, No. 1, 23–8, 15 figs.

*Lagochilascaris minor* is normally parasitic in the alimentary canal of the wild cat and leopard of South America. It is a rare parasite of man and has been recorded from man only in the Caribbean region and in Surinam. The authors refer to earlier records of its occurrence in man in subcutaneous abscesses and in mastoid and tonsillary abscesses. The worm causes chronic illness and " much discomfort ".

They describe the infection of an adult Negress from the Para district, near Paramaribo, Surinam, who had an " infiltrated skin " at the right side of the neck near the lateral margin of the thyroid gland. This was excised and sections showed a nematode surrounded by inflammatory connective tissue. A few days later, when the bandage was changed, a dead worm, about 1·5 cm. long, was found on the gauze. The patient recovered, but returned 6 months later with an abscess at the site of the excision in which a few living worms, all females, were found. After

about 1 hour many eggs appeared and larvae developed in these in about 3 hours. Later many more worms were evacuated from the abscess. The worms were identified as *Lagochilascaris minor*. No evidence of other parasites was found in the stools and blood examination for malaria and microfilariae was negative. Treatment with diethylcarbamazine, though apparently successful at first, had no result.

Five months after her discharge the patient returned again with a much larger swelling at the same site, extending to the back of the neck. " As it was possible that the worm had now arrived in the mastoid the troubles of this patient are practically certain to continue for a long time."

The mode of infection and dissemination in the body is not known. The patient had never been in contact with " cats or other feline animals ". The authors suggest that tabanid or other blood-sucking insects, which abound in the jungle where the leopard lives, may be vectors and that the rarity of human infection may be due to the fact that the eggs are very fragile; but they doubt whether the infection is really rare, because festering wounds on uncovered parts of the body are often observed in the interior and contacts with people living in the bush are " so far rather slight ".

The paper is illustrated with excellent photographs of sections showing the worms *in situ*, the external appearance of the lesion on the neck, the excised abscess containing the worms, hundreds of the worms taken from this abscess and the diagnostic features of the eggs, the larvae and the adult female worm. *G. Lapage*

Heiner, D. C. & Kevy, S. V. **Visceral Larva Migrans. Report of the Syndrome in Three Siblings.** *New England J. of Med.* 1956, Apr. 5, v. 254, No. 14, 629–36, 9 figs. [19 refs.]

This syndrome, which is being recognized with increasing frequency (the authors found 8 new cases during 7 months at the Massachusetts General Hospital), is attributed to the ingestion of the embryonated eggs of the roundworms, *Toxocara canis* of the dog and *Toxocara mystax* of the cat, and the subsequent migration of the larvae. The syndrome has been discussed by Beaver *et al.* (*Pediatrics*, 1952, v. 9, 7) and by Smith and Beaver (*Pediat. Clin. North America*, 1955, v. 2, 163).

The authors state that the most consistent sign of the syndrome is leucocytosis and eosinophilia, the white cell count ranging from 12,000 to 100,000 per cmm. and the eosinophils making up " 15 to 80 per cent of the total ". The eosinophilia may persist for several years. The authors here describe abnormal eosinophils found in the peripheral blood of all 3 of the affected children discussed and in the bone-marrow of 2 of them. These cells were of variable size, many being large, with vacuolated cytoplasm and fewer granules than usual, and variable staining qualities. Smith and Beaver stated that hepatomegaly is constant, but

the present authors found that it " need not always be so " and Zuelzer and Apt (*Amer. J. Dis. Children*, 1949, v. 78, 153) described 2 cases without enlarged livers. Splenomegaly is common. Pulmonary infiltration, leading to respiratory distress, usually with wheezing, may be the most prominent sign and may prove fatal. Various kinds of rash occur. Nematode larvae, not proved to be those of *Toxocara*, have been reported in the brain, associated with convulsions, by Smith and Beaver and by Beautyman and Woolf [this *Bulletin*, 1952, v. 49, 529], and also in the eyes in association with " pseudotumor ", choroiditis and other troubles, by Smith and Beaver and by Wilder (*Trans. Amer. Acad. Ophth.*, 1950, v. 55, 99) and also in other organs. [For a review of knowledge of invasion of the central nervous system by nematodes see Sprent [this *Bulletin*, 1955, v. 52, 1001, 1002.]

Hyperglobulinaemia has been a valuable diagnostic aid. In the 3 cases described it was due to increase in the gamma globulins. Diagnosis is helped by the finding of fertile ascarid eggs in the soil or basement dust of the patients' homes, in which viable eggs have been found after several years. Usually the syndrome is seen in children aged 1 to 4 years, because it is often associated with pica and infection from the faeces of dogs or cats. The syndrome is sometimes seen together with lead poisoning, both being due to pica. Infection of dogs with *Toxocara* is common, a recent study in Boston having shown that 20 per cent. of 992 faecal samples contained the eggs, the infection being commonest in very young dogs.

The paper gives details of clinical and laboratory examinations of 3 sisters, all young girls. One aged 3 years, was seriously ill and nearly died. She had splenomegaly, hepatomegaly, recurrent pneumonitis and a rash on the abdomen and extremities, with, on 3 occasions, attacks of cyanosis, wheezing and severe respiratory distress. During her stay in hospital her white cell count ranged from 8,000 to 21,000 per cmm. with an eosinophilia of 18 to 67 per cent. at different times. She showed hypergammaglobulinaemia and the X-ray showed areas of infiltration in the lungs and increased density in the perihilar regions. Biopsy of the skin showed a normal epidermis with an inflammatory exudate in the dermis consisting of histiocytes and some eosinophils and occasional areas of collagen degeneration. No larvae were found in the skin, but it was assumed that the skin lesions were due to visceral larva migrans. Other experts, however, agreed that diagnosis was not possible by skin biopsy. Treated with oxygen and tetracycline, this patient recovered from each attack. She had a history of frequent dirt-eating and one ascarid egg was found in the backyard soil of her home, but the dog and cat kept at the house could not be examined.

Her sister, aged 2 years, had similar, but milder, symptoms with a white cell count of 32,750 per cmm. with 65 per cent. of eosinophils. The third sister, aged 4 had no symptoms, but was considered to be a mild case on the basis of a white cell count of 17,000 per cmm., an

eosinophilia of 59 per cent., filter-paper electrophoresis of serum proteins, determination of gamma globulins and a positive precipitin reaction to *Toxocara* antigen.

The authors have not found an earlier report of 3 simultaneous cases in one family, but this has occurred in siblings and Smith, in a personal communication to the authors, reported the syndrome in 3 members of a Wisconsin family, in one of whom liver biopsy was done. The present authors do not think that liver biopsy is justified, because larvae are not often found by it and the clinical signs are usually enough for diagnosis.

Skin tests under investigation may soon become useful aids to diagnosis. The syndrome must be differentiated from human ascariasis, " familial eosinophilia ", eosinophilic leukaemia, and Löeffler's syndrome (of which it is one of several causes).

There is no therapy of proved value for the fulminating respiratory distress, but the authors suggest oxygen, coverage with broad-spectrum antibiotics, trials of epinephrine, corticotrophin or steroids and cautious trials of anthelmintics (one of their patients was treated with diethylcarbamazine without result), although the possible results of rapid killing of numerous larvae should be remembered. Exposure to the eggs should be prevented as far as possible. Dogs and cats should be periodically dewormed. Soil may be turned over or ploughed to put the eggs out of reach and a good diet will provide a substitute for dirt-eating, which may also be treated psychologically. *G. Lapage*

Brygoo, E. R. & Escolivet, J. Enquête sur la filariose aux Comores, à Mayotte et Mohéli. [**Survey of Filariasis in Mayotte and Mohéli, Comoro Archipelago**] *Bull. Soc. Path. Exot.* 1955, v. 48, No. 6, 833–8.

Thick blood films were taken at night (after 8 p.m.) from inhabitants (of over 15 years of age) of 2 islands in the Comoro Archipelago, Mayotte and Mohéli, with a view to estimating the incidence of microfilariae of *Wuchereria bancrofti*. At Mayotte, 26·7 per cent. of 736 females and 48 per cent. of 706 males examined were positive. At Mohéli 38 per cent. of 936 females and 48·7 per cent. of 1,060 males were positive.

Elephantiasis of the lower limbs was observed in 0·8 per cent. of 6,636 people at Mayotte and 61 cases of elephantiasis of the scrotum were seen. At Mohéli the figures were 1·7 per cent. of 5,736 with 60 cases of elephantiasis of the scrotum. At Mayotte there were 4 cases of elephantiasis of the breast.

The mosquitoes of the Archipelago are not well known, but the authors collected adults and reared adults from larvae of the following species: Mayotte, *Aëdes aegypti*, *Aëdes simpsoni*, *Eretmapodites quinquevittatus*, *Ravelanites roubaudi*; Mohéli, *Anopheles pretoriensis*, *Aëdes aegypti*, *Aëdes simpsoni*, *Aëdes albocephalus*, *Culex pipiens* s.sp. *fatigans*, *Culex simpsoni*, *Eretmapodites quinquevittatus* and *E. subsimplicipes*. Further

research on the precise identity of the vectors and their biology is needed, after which, it is believed, suppression of filariasis will become possible in these islands. The island of Mohéli in particular lends itself to a large-scale experiment in eradication. *J. J. C. Buckley*

Souveine, G., Dodin, A., Grjebine, A. & Brygoo, E. R. Périodicité des microfilaires sanguines de la côte Est de Madagascar. [**Periodicity of Microfilaria in the Blood on the East Coast of Madagascar**] *Bull. Soc. Path. Exot.* 1955, v. 48, No. 5, 669–72, 1 fig.

During an investigation of filariasis on the south-east Coast of Madagascar, the periodicity of the local microfilariae was ascertained. Thick drops of 20 cmm. of blood were taken, at 2-hour intervals: on each occasion 3 preparations were made. Four young soldiers who were indigenous to the area and who had numerous microfilariae with the characters of *W. bancrofti* var. *vauceli* were chosen for examination [see this *Bulletin*, 1956, v. 53, 630].

A typical nocturnal curve was obtained with its maximum lasting from 8.30 p.m. to 6.30 a.m. *Philip Manson-Bahr*

Subramanian, R. & Bhate, M. R. **Filaria Survey of Drug Town.** *Bull. Nat. Soc. India for Malaria & other Mosquito-Borne Dis.* 1956, Jan., v. 4, No. 1, 17–20.

The town of Drug is situated 165 miles from Nagpur in Madhya Pradesh, India. The sanitation is very poor. A distinctive feature is the presence of 14 tanks, resulting from the cutting of banks across a disused moat, and these water collections are ideal breeding grounds for mosquitoes.

Recently Drug town has developed special importance because a steel project has been established there. In November 1955 a filaria survey was made in which night blood specimens were taken from 1,110 of the 20,249 residents. Microfilariae were found in 61 blood smears (5·5 per cent.); all but 3 (which were those of *Wuchereria malayi*) were those of *W. bancrofti*. Ten persons had clinical manifestations of filarial disease, but only one of them showed microfilariae. It was noted that all 3 cases of *W. malayi* infection were in recent immigrants from the village of Dhamda, 21 miles away, where *W. malayi* infection is prominent [this *Bulletin*, 1946, v. 43, 231].

Six species of mosquitoes were found, the predominant species being *Culex fatigans* and *Mansonioides annulifera*; only the former were found to be infected, and 6 of 153 specimens dissected were shown to contain developmental forms of *W. bancrofti*.

All the features described indicated ideal conditions for the spread of filariasis, and in view of the siting of the steel project the need for

organization of a filaria control programme is stressed. [This is an example of the need for coincidental public health planning where industrial projects are contemplated in previously underdeveloped areas.]

*H. J. O'D. Burke-Gaffney*

Rozeboom, L. E. & Cabrera, B. D. **Filariasis in the Philippine Islands.** *Amer. J. Hyg.* 1956, Mar., v. 63, No. 2, 140–49, 1 fig. [16 refs.]

Since the work of Ashburn and Craig in 1907 it has been realized that filariasis is widely distributed in the Philippine Islands and it was claimed at first that the microfilariae were non-periodic and underwent development in *Culex fatigans*. The purpose of the present study was to obtain additional information concerning the distribution and incidence of filariasis throughout these islands with particular reference to its association with *abaca* (Manila hemp). It was important to obtain this information before the widespread use of DDT for malaria control influences the filariasis rate in man.

The existence of 30 Malaria Control Field Units has made it possible to obtain blood films from a number of widely separated localities in the islands. Out of a total of 1,970 blood films 4·8 per cent. were positive. This number was found in 13 out of 36 localities and the microfilaria rate among the 706 people there was 13·3 per cent.

A strong correlation was found between plantations of *abaca* and filariasis, and out of 23 localities in which *abaca* was absent, 20 were negative for filariasis. However, high microfilaria rates were found in 2 communities where epidemiological factors are not associated with *abaca*, namely a mountainous area in northern Luzon and a forested region in Palawan.

As regards the age and sex distribution, about 10 per cent. of both males and females were infected up to the age of 25, but in males there was a progressively higher infection rate in each of the succeeding age-groups culminating in a 40 per cent. rate in the oldest group.

In experimental infection of Manila and Sorsogon strains of *Culex fatigans* no real difference between them as potential hosts of *W. bancrofti* could be ascertained and only about one-third supported growth of larvae to the infective stage: most contained only 1 or 2 such larvae and the greatest number was 15.

These results, compared with those of earlier surveys, indicate that there has been little change in the incidence of filariasis in the Philippines in the last half century. It is assumed that adult males working in *abaca* plantations are particularly exposed to bites of vector mosquitoes. Although as the result of 2 years' application of DDT it has not been possible to find mosquitoes in houses for dissection to ascertain the natural infection rates, there has been, as yet, no real reduction in the prevalence of microfilaraemia. In spite of the success of laboratory transmission the view is expressed (from the authors' inability to find

autochthonous cases in Manila) that *Culex fatigans* is not a vector in the Philippines. On the other hand *Aëdes poicilius*, which bites out of doors as well as indoors, appears to be an important vector in the *abaca* area, but the authors were unable to prove this conclusively.

[The explanatory maps of the Islands have been so far reduced as to be illegible.] *Philip Manson-Bahr*

Wilson, T. **Differences between the Microfilariae of *Wuchereria malayi* and *Wuchereria bancrofti* in Giemsa-Stained Thick Blood Films.** *Trans. Roy. Soc. Trop. Med. & Hyg.* 1956, Jan., v. 50, No. 1, 54–7, 4 coloured figs. on 2 pls.

"The object of this note is to emphasize that, in thick blood films stained with dilute Giemsa, there are colour contrasts between the microfilariae of *W. malayi* and *W. bancrofti*; the combination of colour contrast and morphological difference is a considerable help in the identification of species." The technique employed is a modification of that described by Field [this *Bulletin*, 1950, v. 47, 307] in which the preparation of the stain from the Giemsa powder was also described. For staining the microfilariae the procedure is as follows: "Capillary tubes previously graduated and marked to 20 c.mm. are used with the Sinton capillary pipette. Collection of blood begins soon after nightfall, using a fresh tube for each person, and spreading three blood films on each slide. The films are dried overnight, and placed on edge in staining troughs next day, without dehaemoglobinizing. To 100 ml. of phosphate buffer solution at *p*H 7·2 are added 70 drops of Giemsa stain (a dilution of about 1 in 50), the mixture is poured into the staining trough, and the films are stained for 1 hour. After washing and drying, the films are examined at a magnification of 100 diameters, and the number of microfilariae noted."

The colour contrasts brought out by this method are as follows. The sheath in *W. bancrofti* is seldom visible whereas in *W. malayi* it is a bright pink colour. (In films which have dried slowly, empty sheaths are often seen.) The body nuclei in *W. bancrofti* stain blue and are discrete and separate; in *malayi* they are dark purple and are smudged and overlapping.

The differences are strikingly illustrated in coloured plates.

*J. J. C. Buckley*

Buckley, J. J. C. & Edeson, J. F. B. **On the Adult Morphology of *Wuchereria* sp. (*malayi*?) from a Monkey (*Macaca irus*) and from Cats in Malaya, and on *Wuchereria pahangi* n.sp. from a Dog and a Cat.** *J. Helminthology.* 1956, v. 30, No. 1, 1–20, 24 figs.

In 1955, Edeson *et al.* [this *Bulletin*, 1956, v. 53, 349] made a preliminary report on the occurrence of microfilariae resembling those of

*W. malayi*, in the blood of dogs and cats and in three different kinds of Primates. The infected animals came from areas of endemic human filariasis due to *W. malayi* in East Pahang. They also reported that adult worms of the genus *Wuchereria* had been recovered from the lymphatic systems of the Kra monkey, the dog and cat. In their first report the authors, while recognizing the possible importance of this discovery, were careful to point out that the relationship of these animal infections to human filariasis could not be assessed until much more work had been carried out. The present paper is concerned with the results of further detailed examination of the morphology of the worms recovered at the original autopsies.

" Morphological studies on this material revealed a new species, herein named *W. pahangi*, in the dog and in one cat; a species in the Kra monkey which is close to and probably identical with adults of *W. malayi* as described by Bonne *et al.* (1941) from man in Indonesia; but its relationships, and also those of the species from man in Indonesia, with the *W. malayi* described by Rao & Maplestone (1939) in India need further investigation. Three cats harboured a species which is close to that in the Kra monkey but its identity is *sub judice* until further material is available. Fragments only of a female worm, which included the tail, were recovered from the Slow Loris. It is thought that this material may be the new species *W. pahangi*."

The authors are of the opinion that even if the examination of further material shows no morphological differences between the adults of *W. malayi* recovered from man and certain of the adult filariae recovered from animal hosts, it does not follow that the animal hosts represent reservoirs of infection for man. " Should, for example, the adult worms from the Kra monkey prove to be identical with those harboured by man, it cannot be assumed from this morphological evidence that reciprocal infection by this species between the two kinds of hosts is a physiological possibility (*cf. Ascaris lumbricoides* in man and pig). Cross-transmission experiments alone can provide the answer to this problem."

*R. M. Gordon*

Fros, J. **Filariasis in South-American Indians in Surinam.** *Documenta Med. Geograph. et Trop.* Amsterdam. 1956, Mar., v. 8, No. 1, 63–9. 4 figs.

*Mansonella ozzardi* has been reported from N. Argentina, along the north coast of South America, Panama, Yucatan, St. Vincent, St. Lucia, Dominica, Puerto Rico and Colombia. It has been found in Surinam in a sloth by Vleming (*Tijdschr. v. Vergelijk. Geneesk.*, 1918, v. 3, 55). This species is sometimes associated with *Dipetalonema perstans*, which is found in Africa, Argentina, Venezuela and Trinidad. In Surinam these two species occur practically exclusively in Amerindians in the

savannah. As is well known, when found together they can be distinguished by differences in the structure of the tail. The morphology of the 2 species is discussed and illustrated by 4 photomicrographs.

Blood specimens of 881 lowland-living Amerindians, 200 upland Indians, 823 bush Negroes, 208 Creoles, 10 Indonesians, and 7 Hindustani from the savannah belt in the interior of Surinam were examined for microfilariae. Those of *W. bancrofti* were found only in one Amerindian, one Hindustani, 3 bush Negroes and 5 Creoles. Unsheathed microfilariae were found in 28·7 per cent. of lowland Amerindians and in 1·9 per cent. of Creoles. Upland Amerindians were not infected.

In lowland Amerindians *M. ozzardi* predominated. It is the only indigenous filaria in man in Central and South America; *D. perstans* was probably imported from Africa by shipments of Negro slaves.

*M. ozzardi* infection was found to decrease gradually in the lowland Amerindian in the direction from East to West, while *D. perstans* increased in that direction. *Philip Manson-Bahr*

Kinmonth, J. B., Taylor, G. W. & Harper, R. K. **Lymphangiography. A Technique for its Clinical Use in the Lower Limb.** *Brit. Med. J.* 1955, Apr. 16, 940–42, 4 figs.

Normal lymph vessels are much smaller than the arteries and veins used in angiography, contain colourless lymph and under normal circumstances may be empty or nearly so, existing as potential spaces. In the authors' method the lymph trunks are made visible to the naked eye by subcutaneous injection of a diffusible blue dye, so that radio-opaque solution can be injected direct into them through a small needle.

*Method for the leg and thigh.* The dye, patent blue violet or patent blue V, is made into isotonic (11 per cent.) solution in distilled water and autoclaved; 2–2·5 ml. of this solution are injected subcutaneously between the toes, 0·5 ml. into each web which is massaged for half a minute.

The ankle, knee and hip joints are then passively moved repeatedly through a full range for 5 mins., so that the lymph trunks are filled by the dye and the patient becomes blue [in this dosage the dye is without toxic effects]. The dye is excreted in the urine within 24 hours and normal colour is regained. Severe oedema should be reduced by elevation and massage for a few days beforehand, to clear lymph trunks of waterlogging.

A bloodless field may be produced by a rubber bandage and air cuff, or the patient may be tilted into a full Trendelenberg position.

A transverse incision is made into the skin of the dorsum of the foot, 2 inches proximal to the webs of the toes. Lymph trunks may be seen filled with blue dye before the incision is made. The incision is deepened and bleeding points are coagulated with diathermy. Normal lymph

trunks are just under 1 mm. in diameter, and a length of 5–6 mm. is exposed by pushing the edges of the incision apart with the scalpel; the superficial aspect must be cleanly exposed, but not its whole circumference, or it may collapse.

An assistant's fingers, 1 inch above the incision, obstruct the lymph flow while the surgeon massages the interdigital area to distend the trunk.

The radio-opaque solution is 70 per cent. diodone (Pyelosil has given good results). A No. 18 hypodermic needle in a 10 ml. syringe is introduced 2 mm. into the lymph trunk and, if it is accurately placed, the vessel becomes white and transparent, otherwise a bleb forms and a fresh attempt must be made in the same or in another vessel. The injection is continued until 10 ml. are injected, but if extravasation occurs it is stopped, though good results may sometimes be obtained with only 1 ml.

The needle is withdrawn, the table altered to the horizontal position. the X-ray tube swung into position and the exposure made at once, as the diodone diffuses out in a few minutes.

*Radiological technique.* Non-screened films should be used for the extremities and screened film for the thicker parts. Exposure time need not be so critical as in arteriography, as flow in the lymphatics is slow, but immobility is essential to avoid blurring. For the limbs the authors' technique has been as follows: non-screen film: 65 kV, 65 mA; time 2 seconds; distance 48 in. For the thicker parts they used cassette and grid: 80 kV, 45–50 mA, 1·5 sec.; 48 in. Films or cassettes are placed in boxes under the sterile towels before examination. Several non-screened films can be used, protected from each other by lead-protected trays.

[A trial of this technique in tropical elephantiasis has recently been started; the results will be awaited with interest.] *W. L. Harnett*

Reis, C. M. S. Alguns aspectos da filaríase *perstans* em Mocímboa da Praia. [**Certain Aspects of** *Dipetalonema perstans* **Infection in Mocímboa da Praia, Mozambique**] *Anais Inst. Med. Trop.* Lisbon. 1955, Dec., v. 12, No. 4, 659–90, 2 folding graphs & 1 folding fig. [58 refs.] English summary.

This is a somewhat discursive account of the incidence of *Dipetalonema perstans* infections in the extreme north-east of the Cape Delgado District of Mozambique and is mainly concerned with the clinical manifestations of the infection. A short account is given of the physical geography of the region. About 6 per cent. of the population harbour the infection. The incidence in the coastal districts is more than double that of the interior. Male cases outnumber female in the proportion of 3 to 1.

Though most cases are asymptomatic, clinical manifestations, other than general malaise, that have been ascribed to the infection in patients

treated by the author and his colleagues are febrile, anaemic, lymphatic, pulmonary, nephritic and psychic disturbances. A few representative cases are described. The possibility of fever being directly due to *D. perstans* infection merits consideration in the sometimes difficult differential diagnosis of cases of fever among the indigenous population.

The treatment of *D. perstans* infections with diethylcarbamazine has given good results. *Norman White*

Lépine, P., Deschiens, R., Gagé, Monique & Vincent, J. Présence apparemment insolite et conservation de microfilaires du singe dans les cultures de tissus. [**Unusual Presence and Persistence of Simian Microfilariae in Tissue Cultures**] *Bull. Soc. Path. Exot.* 1955, v. 48, No. 6, 838–43, 3 figs. on 2 pls. [10 refs.]

In tissue cultures made with renal cells from monkeys (*Papio sphinx*), living microfilariae were observed which survived for a long time—up to 14 days. They were observed on several occasions and attempts to exclude them by preliminary examination of the blood of the monkeys were unsuccessful. It was necessary to treat the monkeys to remove the microfilariae or to eliminate them by slow centrifugation of the cellular suspension.

Two species of microfilariae were observed, a small unsheathed form 150 $\mu$ × 5 $\mu$, believed to be *Dipetalonema vanhoofi* [this *Bulletin*, 1947, v. 44, 339] and a larger sheathed form, 250–360 $\mu$ long by 7 $\mu$ in breadth resembling those of *Loa loa*. *J. J. C. Buckley*

Blanc, M. & D'Aubenton, F. Observations préliminaires relatives à une campagne de lutte contre l'onchocercose. Action de quelques insecticides sur les poissons. [**Preliminary Observations on a Control Campaign against Onchocerciasis; Action of Some Insecticides on Fish**] *Méd. Trop.* Marseilles. 1956, Jan.–Feb., v. 16, No. 1, 93–100. [11 refs.]

The people of the Upper Volta, French West Africa, are dependent on fish as food. Consequently a campaign against *Simulium* (*S. damnosum*) must include precautions against the detrimental action of insecticides upon the fish population of the treated waters. The authors recommend the dry season, February and March, as the best period for a campaign, as this is outside the reproductive period of the fish, the water flow is more easily calculated (this is described), and the quantity of insecticide needed is less.

Fish belonging to some of the families of fish found in Upper Volta (Cyprinids, Silurids, Cyprinodonts and Cichlids), but not identical species, and fish of other families, were tested against insecticides in Paris. They

were placed in water treated with insecticide at the appropriate temperature for 30 minutes, washed, and replaced in their aquaria. Lindane, in the form of Lindamul (120 gm. lindane per litre), was shown to be very toxic to fish, especially Percids, Centrarchids and Cichlids. Doses of 1 mgm. per litre of Lindamul were sufficient to cause death, repeated doses causing certain death. All the fish were found to tolerate DDT in the form of Dedemul (250 gm. DDT per litre) and Neocide (200 gm. DDT per litre) at doses of 7 mgm. per litre. Analogous symptoms to lindane poisoning were obtained with a concentration of 10 mgm. per litre. The authors point out that doses of lindane lethal to fish may not be effective against *Simulium*, while the effectiveness against *Simulium*, of the non-toxic doses of DDT awaits field trials in the region.

*B. R. Laurence*

Ballesteros Bermudez, J. & Burgos Courlaender, C. Tricocéfalos como causa de diarrea crónica en los niños. Tratamiento de esta con enemas de Hexylresorcinol. [**Whipworms as a Cause of Chronic Diarrhoea in Children. Treatment with Hexylresorcinol Enemas**] *Jornadas Nacionales de Puericult. y Pediatr.* Valencia. 1955, Mar. 2–6, v. 2, 739–57. [13 refs.]

The English summary appended to the paper is as follows:—

"It is possible to make a clinical differentiation of a chronic diarrheal syndrome due to whipworms, the presence of parasites attached to the mucosa in rectal prolapsus being a pathognomonic sign. A clinical separation is made between cases of *heavy whipworm infections* and *extreme whipworm infections*. The rectosigmoidoscope was found useful as a help to establish with certainty the diagnosis of such degrees of infection, and also to show up other lesions not connected with the presence of whipworms.

"Treatment of these cases was frequently unsuccessful until the introduction of enemas of hexylresorcinol at a concentration of 0·33 per cent in a 5 per cent aqueous solution of gum arabic. The technique of such infections is discussed. In all of them a clinical cure was obtained.

"The importance of whipworms as an etiologic factor of chronic diarrhea of infants and children was not found in a revision made of the Venezuelan literature until 1954."

Atías, A. & Gajardo, R. Tricocefalosis infantil masiva. [**Massive Trichuriasis in Children**] *Bol. Chileno de Parasit.* 1955, Oct.–Dec., v. 10, No. 4, 78–9.

The English summary appended to the paper is as follows:—

"*Trichuris trichiura* infections found in Chile have been, so far, practically asymptomatic. This is probably due to the small number of worms usually present in the intestine. The first case recorded of a heavy

infection with serious injury to the patient is now reported. The patient, 5 years old, presented mucous and bloody diarrhea during 6 months, with general conditions rapidly deteriorating. At the hospital, severe anaemia and *T. trichiura* eggs in the faeces were found. Acute peritonitis developed after 5 days and the patient died. Pathological examination showed massive *T. trichiura* infection of the colon and histological alterations suggesting pellagra. The factors that probably explain the severe course of the infection are nutritional deficiency, avitaminosis and very poor sanitary conditions."

Hall, J. E. & Sonnenberg, B. **An Apparent Case of Human Infection with the Whipworm of Dogs, *Trichuris vulpis* (Froelich, 1789).** *J. Parasitology.* 1956, Apr., v. 42, No. 2, 197–9. [11 refs.]

"A female specimen of *Trichuris*, obtained from the feces of a four-year-old boy who had spent his entire life within Maryland, is tentatively identified on the basis of egg size and characters of the female reproductive organs as *Trichuris vulpis* (Froelich, 1789)."

Modi, C. J., Dave, C. V. & Oza, J. L. **Piperazine Therapy in Threadworm Infestation.** *Indian J. Med. Sci.* 1956, Apr., v. 10, No. 4, 278–80.

"1. Experiences with piperazine citrate in the treatment of 24 cases of threadworm infestation are described.

"2. The drug on a 50 mg./Kg. per day basis appears to be effective in about 73 per cent of the cases treated for a total period of 14 days with an in between rest period of 7 days after the first week of treatment."

See also p. 1118, Young & Freed, **The Effect of Puromycin against *Entamoeba histolytica* and other Intestinal Parasites.**

Hankes, L. V. & Stoner, R. D. ***In vitro* Metabolism of DL-Alanine-2-C-14 and Glycine-2-C-14 by *Trichinella spiralis* Larvae.** *Proc. Soc. Exper. Biol. & Med.* 1956, Mar., v. 91, No. 3, 443–6.

Coker, C. M. **Cellular Factors in Acquired Immuity to *Trichinella spiralis*, as indicated by Cortisone Treatment of Mice.** *J. Infect. Dis.* 1956, Mar.–Apr., v. 98, No. 2, 187–97, 2 pls. [27 refs.]

## DEFICIENCY DISEASES

Rhodesia, Southern. **Annual Report of the Nutrition Council for 1955** [Jones, E. B., Exec. Officer]. 13 mimeographed pp. 1956, Jan. Causeway: P.O. Box 8152.

Southern Rhodesia employs a Nutrition Officer who writes a series of Annual Reports which are lively, stimulating, and intelligent [this *Bulletin*, 1954, v. 51, 626]. These are mimeographed and apparently then promptly pigeon-holed. This 1955 report provides no evidence of any effective Government action on previous reports and records that during the year there was no meeting of the Nutrition Council, which is presumably responsible for stimulating and coordinating Government policy.

The report begins with an account of the Government's rejection of the application for the appointment of a lady nutritionist, specifically to carry out nutritional surveys and undertake health education. Then it describes how the food technologist appears to have been diverted by a senior physician to the study of the serum proteins of patients with kwashiorkor. [Why this was done, is not stated. Regular readers of this section of the *Bulletin* will be aware that this problem is already being studied in numerous centres, in fact, almost *ad nauseam*.]

FAO sent out to Rhodesia a French expert who was able to demonstrate that it was possible to dilute wheat flour with up to 14 per cent. maize and 7 per cent. sorghum and make an acceptable "Native" bun and white bread. This suggestion would reduce the necessity of importing wheat and make the country more self-dependent. This new bread would also be lower in price than the old and perhaps more nutritious. African consumers appeared to appreciate the new bread, yet this intelligent and imaginative dietary improvement was apparently sabotaged by the Salisbury and District Master Bakers' Association. Although the Government originally asked for international technical advice, they appear to have allowed the local bakers to see that the advice, when given, was not utilized.

The report records that nutritional education classes were organized by the Federation of Women's Institutes and certain Christian Missions. This admirable work appears to be carried on without assistance or even encouragement from the Government. The Women's Institutes appear also to have taken the lead in initiating a scheme for the provision of skimmed milk to African schoolchildren in Bulawayo.

The supply of patent infant foods for Africans is unsuitable. Further, owing to inadequate instruction, the African mother is usually unable to make up the milk and give it to her child in proper amounts.

[One hopes that this excellent report will prove an effective stimulus to action.] *R. Passmore*

Squires, B. T. **Nutrition in the Bechuanaland Protectorate.** *Central African J. of Med.* 1956, Mar., v. 2, No. 3, 112–18, 1 map. [15 refs.]

This is a general review of nutrition problems in a country the size of France, but with a population probably less than 300,000. The average rainfall is 15 to 20 inches a year, but this is very variable and in many areas usually much less. Most of the inhabitants live in settlements where maize and sorghum are grown. The cattle have, however, to be grazed at posts which are often a great distance from the settlements. In consequence, the supply of fresh milk is, in general, inadequate.

Field surveys show that the incidence of malnutrition varies greatly from place to place and from year to year. Classical deficiency diseases, including kwashiorkor, are not seen. In a good season the diet of the people would appear to be adequate, but a succession of bad seasons may seriously impair the health of the children; as a result, they fall an easy prey to infections, notably malaria.

[This review gives no account of any plans, agricultural, hydro-engineering, social or economic, by means of which the ill effects of bad seasons might be mitigated.] *R. Passmore*

Andersson, Marianne, Walker, A. R. P. & Falcke, H. C. **An Investigation of the Rarity of Infantile Scurvy among the South African Bantu.** *Brit. J. Nutrition.* 1956, v. 10, No. 2, 101–5. [13 refs.]

Mehta, G., Venkatachalam, P. S. & Gopalan, C. **Steatorrhoea in Nutritional Oedema Syndrome (Kwashiorkor).** *Indian J. Med. Res.* 1956, Apr., v. 44, No. 2, 231–5.

"1. An investigation of steatorrhoea in six cases of nutritional oedema syndrome (kwashiorkor) was carried out.

"2. On diet supplying negligible amounts of fat the output of fat in the faeces exceeded its intake. The origin of faecal fat was considered to be partly exogenous and partly endogenous.

"3. The administration of glucose aggravated the steatorrhoea.

"4. Wheat diet did not aggravate the steatorrhoea; folic acid had no beneficial effect.

"5. Steatorrhoea was found to be more marked on a diet containing ground-nut oil than on a diet containing an equal amount of fat derived from butter.

"6. Steatorrhoea was found to persist in cases of nutritional oedema syndrome long after they had been clinically cured and discharged."

[See this *Bulletin*, 1955, v. 52, 568.]

## HAEMATOLOGY

See also p. 1134, Pessoa *et al.*, Sôbre a anemia na esquistossomose mansônica em zonas urbana e rural do Estado da Paraíba. [**Anaemia in Cases of *Schistosoma mansoni* Infection in an Urban and in a Rural Area in the State of Paraíba**]

Wilkinson, J. **A Case of Aplastic Anaemia showing the Haemorrhagic Bullae of Onyalai.** *East African Med. J.* 1956, Mar., v. 33, No. 3, 92–5.

A Kikuyu aged 38 who suffered from abdominal pain and diarrhoea (for which he received a course of sulphathiazole), and subsequently severe melaena, eventually developed bleeding gums and blood bullae on the tongue and cheek, together with petechiae of the buccal mucosa. The blood picture was that of a pancytopenia with prolonged bleeding time and poor clot retraction. The patient died from an intestinal haemorrhage on the 17th day after admission and the usual appearances of severe anaemia were found at autopsy.

The history of the case was complicated by treatment with male fern for a presumed tapeworm infection, and later an unknown quantity of sulphadimidine had been given for the diarrhoea. The history was bound up with a story of witchcraft and failure to provide all the facts, including the existence of bleeding gums before the patient's admission to hospital.

The author has no doubt that the patient suffered from aplastic anaemia (although sternal marrow puncture could not be undertaken): this condition is very rare in Africans. The secondary thrombocytopenic purpura as a result of depressed numbers of platelets, was associated with blood bullae such as occur in onyalai: this association appears to be constant in Africans and the author knows of no case where this purpura occurred in Africans without haemorrhagic bullae.

The cause of the aplasia is discussed and, after elimination of several possibilities, it is considered probable that the bone-marrow was depressed initially by the sulphadimidine and depressed further by the sulphathiazole. The latter drug is known to have been associated with aplastic anaemia in other cases [see, for example, *Bull. Hyg.*, 1946, v. 21, 713].

*H. J. O'D. Burke-Gaffney*

Keeley, K. J. & Politzer, W. M. **Amino-Aciduria in the Megaloblastic Anaemias.** *J. Clin. Path.* 1956, May, v. 9, No. 2, 142–3.

"Amino-acids in excess were absent from the urine in seven cases of non-Addisonian megaloblastic anaemia in Africans.

"It is suggested that urinary chromatography be used to differentiate Addisonian from other megaloblastic anaemias."

Aksoy, M. **Sickle-Cell Anemia in South Turkey. A Study of Fifteen Cases in Twelve White Families.** *Blood.* 1956, May, v. 11, No. 5, 460–72, 2 figs. [46 refs.]

"1. Fifteen cases of sickle-cell anemia in twelve white families in southern Turkey are reported.

"2. In all these cases of sickle-cell anemia and their families, there was no suggestion of anything Negroid in their features or coloring.

"3. The hereditary trait of these patients has been investigated. In 53 healthy members of twelve families 37 persons had sickle-cell traits.

"4. With the exception of case 12, both parents of all cases had sickle-cell trait.

"5. The possible explanations of the frequent occurrence of sickle-cell anemia and the fairly high incidence of sickle-cell trait in this white community have also been considered."

[See this *Bulletin*, 1956, v. 53, 1046.]

Kraus, A. P. & Diggs, L. W. *In vitro* **Crystallization of Hemoglobin occurring in Citrated Blood from Patients with Hemoglobin C.** *J. Lab. & Clin. Med.* 1956, May, v. 47, No. 5, 700–705, 4 figs.

Jacob, G. F., Lehmann, H. & Raper, A. B. **Haemoglobin D in Indians of Gujerati Origin in Uganda.** *East African Med. J.* 1956, Apr., v. 33, No. 4, 135–8, 1 fig.

"Haemoglobin D was found in 2 of 176 unrelated Gujerati school-children in Kampala. By examining the family of one of these, further instances were discovered.

"The anthropological and clinical implications of this finding are briefly discussed."

Brumpt, L., de Traverse, P. M. & Coquelet, M. L. Interaction entre hémoglobine E et trait thalassémique au Cambodge. [**Interaction between Haemoglobin E and the Thalassaemia Trait in Cambodia**] *C.R. Soc. Biol.* 1956, v. 150, No. 1, 147–51, 3 figs.

See this *Bulletin*, 1956, v. 53, 236.

Lie-Injo Luan Eng, Mursadik, Liem Djwan Lioe & Odang, U. **Haemoglobin E-Thalassaemia Disease in Indonesia.** *Documenta Med. Geograph. et Trop.* Amsterdam. 1956, June, v. 8, No. 2, 135–43, 6 figs. [12 refs.]

"Description of four cases of haemoglobin E-thalassaemia disease in children (three Indonesians and one Indo-European), and one in an adult Indonesian female who was thought to carry haemoglobin E and

thalassaemia trait simultaneously. Haemoglobin analysis showed the pattern E + F in four cases E + A in one case.

"The four children showed symptoms resembling those found in Cooley's anaemia, while the adult case did not show obvious clinical symptoms.

"The findings in other members of the families are also described."

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## VENOMS AND ANTIVENENES

Duguy, R. Note sur l'envenimation expérimentale par venin de *Vipera lebetina* (L.). [**Note on Experimental Poisoning by** *Vipera lebetina* **Venom**] *Bull. Soc. Path. Exot.* 1956, Jan.–Feb., v. 49, No. 1, 108–10.

The following is a translation of the author's summary:—

The venom of *Vipera lebetina* is of a haemorrhagic nature. Its toxicity for guineapigs is about 3 times greater than that of *Vipera aspis* and for mice about half as great. *H. J. O'D. Burke-Gaffney*

Balozet, L. Séparation par électrophorèse de diverses propriétés du venin de *Vipera lebetina* L. [**Separation of Various Properties of** *Vipera lebetina* **Venom by Electrophoresis**] *Arch. Inst. Pasteur d'Algérie.* 1956, Mar., v. 34, No. 1, 100–105, 1 fig.

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## TOXOPLASMOSIS

Ludvík, J. Vergleichende elektronenoptische Untersuchungen an *Toxoplasma gondii* und *Sarcocystis tenella.* [**Comparative Electron-Optical Examinations of** *Toxoplasma gondii* **and** *Sarcocystis tenella*] *Zent. f. Bakt.* I. Abt. Orig. 1956, v. 166, No. 1, 60–65, 15 figs. on 2 pls. [21 refs.]

The English summary appended to the paper is as follows:—

"With the electron microscope the following *organellae* have been observed at the conoid front pole of *Toxoplasma gondii*:

"1. A crateriform pole ring; 2. claviform threads; 3. on the surface of the front of the cell body radiate rib-threads.

"The same corresponding organellae have been examined by electron microscope and described in *Sarcocystis tenellae* too. They may possibly serve in the locomotion and may have penetrative and adhesive functions.

"A slow movement of the front part of the conoid pole could in vital slides be observed by the phase-contrast microscope.

"Superficial motion organellae like lashes, filipodia etc. have never been observed.

"This morphological resemblance between *Sarcocystis* and *Toxoplasma* suggests their relation."

DE CASTRO, Maria P. Divisão multipla de *Toxoplasma* em cultura de tecidos. [**Multiple Division of** *Toxoplasma* **in Tissue Culture**] *Arquivos Inst. Biológico.* S. Paulo. 1955, v. 22, 233–41, 12 figs. on 2 pls. [28 refs.] English summary.

A description of the process.

KOZAR, Z. & SOSZKA, S. **Hormonal Factors in the Development of the** *Toxoplasma* **Infection.** *Bull. State Inst. Marine & Trop. Med. Gdańsk, Poland.* 1956, v. 7, 168. [Also fuller version in Polish 165–7 & in Russian 167–8.]

SCHMIDTKE, Liselotte. Zur Übertragung der Toxoplasmose durch Verfütterung von parasitenhaltigem Gewebe. [**Trials of Transmission of Toxoplasmosis by Feeding with Tissues Infected with the Parasites**] *Ztschr. f. Tropenmed. u. Parasit.* Stuttgart. 1956, v. 7, No. 1, 80–86. [14 refs.]

Attempts were made to infect mice and guineapigs by feeding them for prolonged periods with toxoplasm-infected food. None of the animals became infected and the dye test of Sabin and Feldman remained negative. In further experiments the author shows that toxoplasms and their pseudocysts were destroyed by the gastric juice. This work leads her to conclude that for toxoplasmosis to be contracted *via* the oral route the toxoplasms must enter through epithelial lesions of the mouth or oesophagus.

[This failure to infect animals by feeding them with toxoplasms is not the usual experience.] *I. A. B. Cathie*

LAINSON, R. **Toxoplasmosis in England. I.—The Rabbit** (*Oryctolagus cuniculus*) **as a Host of** *Toxoplasma gondii. Ann. Trop. Med. & Parasit.* 1955, Dec., v. 49, No. 4, 384–96, 4 figs. on pl. & 1 graph. **II.—Variation Factors in the Pathogenesis of** *Toxoplasma* **Infections:**

**the Sudden Increase in Virulence of a Strain after Passage in Multimammate Rats and Canaries.** *Ibid.*, 397–416, 1 text fig. & 2 figs. on pl. [Numerous refs.]

I. In the first paper the author reviews the literary data on rabbit toxoplasmosis and describes his own observations on the infection in Britain, which—unlike previous records—were based on parasitological diagnosis, providing direct evidence of the presence of *Toxoplasma*. The material on domestic rabbits consisted of brains of 113 animals, which were homogenized and suspended in saline. Batches of pooled suspensions (totalling 24) were each inoculated intraperitoneally into mice, which were killed a week later, when stained smears were prepared from their peritoneal exudate and organ suspensions were passaged into new mice. By this method 6 strains of *Toxoplasma* were isolated, representing an incidence of 5·7 per cent. in the rabbits. The rabbit parasites were of low virulence, producing symptomless chronic infections. In the peritoneal fluid they were scanty, while the brain, spinal cord and lungs contained numerous pseudocysts. Similar methods were employed in the examination of 14 laboratory-bred and 122 wild rabbits, but no evidence of toxoplasmosis could be detected in them.

In discussing the part played by rabbits in the epidemiology of toxoplasmosis, the author concludes that they might represent important reservoir hosts of human infection.

For the differential diagnosis between *Toxoplasma* and *Encephalitozoon* (found in some of the experimental mice), comparative complement-fixation tests were carried out with sera of rabbits infected with these parasites against toxoplasmic antigens. While positive reactions were obtained with *Toxoplasma*, they were negative in animals infected with *Encephalitozoon*.

II. In the second paper the author discusses variation in the pathogenicity of *Toxoplasma* observed by different workers, and considers the factors which might affect the virulence of the parasite. The available data provide no evidence that variation in virulence is due to the susceptibility of different hosts, or to the protective action of their antibodies. Neither do the numbers of parasites inoculated, nor the route of inoculation, affect the course of infection. However, experiments on rats have demonstrated that the response to infection varies considerably with the age of the host. Thus, in new-born rats the disease was chronic, in those of the 5–17-day age-group it was acute and fatal, but in older young rats it was symptomless, while adult animals were refractory to infection. The author advances evidence suggesting "that the development of immunity may be influenced by diet, which in this case was governed by the age of the host".

The author then describes changes in the virulence observed in a rabbit strain, which invariably produced mild infections in laboratory rodents. However, when passaged in multimammate rats (*Mastomys coucha*), the

parasites became highly virulent, causing infections with acute clinical symptoms and death within 7–14 days. Some increase of virulence was also observed in canaries infected with this strain. This high virulence persisted in mice passaged from *Mastomys*. It is suggested that the enhancement of the virulence of the rabbit strain might be due to some synergic factors in the rats and birds, which altered the normal physiology of *Toxoplasma*. *C. A. Hoare*

Hirschlerowa, Zofia & Kozar, Z. **Sabin-Feldman Test as an Investigation Method of the Mechanism of Immunity.** *Bull. State Inst. Marine & Trop. Med., Gdańsk, Poland.* 1956, v. 7, 153–5. [Also in Polish 145–50, 5 figs. & Russian 150–52.]

Brown, J. & Jacobs, L. **Adult Toxoplasmosis: Report of a Case due to Laboratory Infection.** *Ann. Intern. Med.* 1956, Mar., v. 44, No. 3, 565–72. [21 refs.]

From a review of the literature the authors conclude that acquired toxoplasmosis may manifest itself as a mild or severe illness simulating infectious mononucleosis. The details of a patient 36 years old who contracted the disease are then presented. Chills, fever, vomiting and aching back and sides occurred over a period of 5 weeks. A macular, purplish rash then developed on the anterior surface of the thighs, lower legs and abdomen. The patient became pyrexial, a tender lymph node the size of a walnut became palpable in the left axilla, and nodes also became palpable in the posterior cervical and left epitrochlear regions. For 3 days after its first development the rash faded and the lymphatic nodes became slightly smaller. Fresh nodes then appeared in the axillary and posterior cervical areas but subjective improvement continued, and after a month the patient became asymptomatic. The dye test for toxoplasmosis became positive in a dilution of 1 in 4096, 7 weeks after the onset of the first symptoms.

Four weeks after the onset of the symptoms the white blood cell count was 4,000 per cmm., this rose in two days to 6,000 and in a further 5 days to 11,000. Differential counts showed between 36 and 46 per cent. lymphocytes present. Atypical lymphocytes were found in small numbers on one occasion only and it is stated that the leukaemoid reaction which occurred has not previously been noted in toxoplasmosis. The authors surmise that a mild haemolytic anaemia was associated with this leukaemoid reaction, their grounds for assuming this being that the haemoglobin fell to 13 gm. per cent. and the reticulocytes amounted to between 3 and 5 per cent. of the red blood cells. The Coombs test, however, was repeatedly negative and the use of radio-active chromium showed that red blood cell survival time was normal. The evidence of a

haemolytic anaemia, is, therefore, not strong and there is no report of the amount of bilirubin in the serum, nor is it stated whether methaemalbumin was present in it or not.

The valuable suggestion is made that cases of unexplained " glandular fever " should be investigated as possibly suffering from toxoplasmosis.

*A. W. Woodruff*

Céspedes, R. & Morera, P. Toxoplasmosis humana generalizada. [**Generalized Human Toxoplasmosis**] *Rev. Biologia Trop.* San José, Costa Rica. 1955, Dec., v. 3, No. 2, 183–202, 21 figs. English summary (7 lines).

See this *Bulletin*, 1956, v. 53, 239.

Wettingfeld, R. F., Rowe, J. & Eyles, D. E. **Treatment of Toxoplasmosis with Pyrimethamine (Daraprim) and Triple Sulfonamide.** *Ann. Intern. Med.* 1956, Mar., v. 44, No. 3, 557–64, 1 fig. [29 refs.]

Of the several points of interest in this paper the first is that a laboratory technician contracted toxoplasmosis while working with virulent *Toxoplasma gondii*; the disease was confirmed parasitologically and the symptoms from the time of infection could be observed in detail. These symptoms included weakness, muscular cramps and fasciculations, fever, drowsiness, cough, loss of weight and severe frontal headache. A small red nodule appeared on the thigh followed in 5 days by the development of a painful and tender mass in the right groin. Seven days later a nodule was noted on the right side of the neck and a chain of firm tender freely moveable nodes was felt in the right posterior cervical region and supraclavicular area 4 days afterwards. After a further 2 days a rash consisting of discrete red maculo-papular lesions developed on the lateral walls of the thorax, abdomen, thighs, shoulders and upper arms.

As the patient had been working with toxoplasma, the Sabin-Feldman dye test for toxoplasmosis had been performed at approximately monthly intervals on her serum for nearly three years prior to the onset of the illness. The test result had usually been an undiluted positive, with occasional tests reading negative or positive at a 1 in 4 dilution during the 2 months immediately prior to the development of symptoms. Shortly after the onset of the illness the titre rose to 1 in 16 and then 1 in 256. It fell to an undiluted positive reaction for 3 weeks and then rose until it gave a positive reaction at a dilution of 1 in 1024. Complement-fixation tests on the patient's serum were carried out but were negative until $3\frac{1}{2}$ months after the onset of the overt illness.

An enlarged, tender right inguinal lymph node was excised and part of it injected intraperitoneally into 3 mice from which at autopsy *Toxoplasma gondii* was recovered. By the same method blood removed from the patient 18 days after the development of the nodule on the

thigh was also shown to contain *Toxoplasma gondii*. It was at this stage in the illness, *i.e.*, 18 days after the development of the nodule in the thigh, that treatment with sulphonamides and pyrimethamine (Daraprim) was commenced. The latter was given in an initial dose of 50 mgm. followed by 25 mgm. in 6 hours and 25 mgm. thereafter daily for 14 days. The day after commencement of treatment the patient became less ill, the fever became lower and the nodes less tender, the cough subsided and the rash began to fade. After 6 days of treatment only a few scattered fading skin lesions remained and these cleared completely in a further 8 days. Only a single lymphatic node 0·5 cm. in diameter in each posterior cervical chain could be considered abnormal 18 days after commencement of treatment. Convalescence was slow but the patient returned to work 3 months after the onset of the illness and a careful ophthalmological follow-up during the period of convalescence revealed no abnormalities.

In this case there was no known occasion on which accidental infection with toxoplasma had occurred nor could a history be obtained of any breakdown in the technique of handling the organisms. The mode of infection remains obscure but it is surmised that it took place by the oral route.

The authors conclude by reviewing knowledge concerning the therapy of toxoplasmosis, pointing out that the agents found to be most effective are sulphonamides, the sulphones and pyrimethamine. There is evidence of synergism between pyrimethamine and sulphones and it appears possible that the combination of these two drugs was responsible for bringing about a cure in the case quoted although a spontaneous remission in the disease cannot be excluded. These two drugs are very effective therapeutically in animal toxoplasmal infections. [This is an important paper in that hitherto there has been but little knowledge of effective means of treating the disease in man; it is to be hoped that further similar well documented and well investigated cases will confirm the value of these drugs in toxoplasmosis.] *A. W. Woodruff*

Kunert, H. & Schmidtke, L. Zur Frage der Dauerausscheidung bei Toxoplasmose. [**Observations on the Duration of Secretion of Toxoplasms**] *Ztschr. f. Tropenmed. u. Parasit.* Stuttgart. 1956, v. 7, No. 1, 87–92. [10 refs.]

Experiments are presented which show that guineapigs with toxoplasmosis do not usually show toxoplasms in their conjunctival or nasopharyngeal secretions, although when infected by the corneal route the parasites may be transiently present in these secretions. The guineapig, therefore, is not a suitable animal in which to study droplet infection with toxoplasms. *I. A. B. Cathie*

## DERMATOLOGY AND FUNGUS DISEASES

Lachmajer, J. & Kozakiewicz, J. **Toxical Skin Inflammation caused by the Caterpillar** *Cnethocampa pinivora* **L.** *Bull. State Inst. Marine & Trop. Med. Gdańsk, Poland.* 1956, v. 7, 201–3. [Also in Polish 196–8 & Russian 198–200.]

See also p. 1186, Bolam & Burtt, **Flea Infestation as a Cause of Papular Urticaria. A Preliminary Investigation.**

O'Leary, D. J. & Curry, F. J. **Coccidioidomycosis. A Review and Presentation of 100 Consecutively Hospitalized Patients.** *Amer. Rev. Tuberculosis.* 1956, Apr., v. 73, No. 4, 501–18, 11 figs. [29 refs.]

This is an admirable account of the pulmonary form of coccidioidomycosis, based on the literature and the study of 100 cases admitted to the Fitzsimons Army Hospital, Pulmonary Disease Service, Colorado, between October 1948 and March 1955. All of the 100 patients, whether suffering from active disease or pulmonary residuals, were clinically ill when admitted. Symptoms referable to the respiratory system were present in 83 and physical signs of pulmonary disease in 22 and of extrapulmonary disease in 6.

The radiological pattern in the lungs was cavitary (single or multiple) in 56, nodular (single or multiple) in 34, infiltrative in 8, pneumonic in 8, hilar mediastinal lymphadenopathy in 7, miliary in 4, hydropneumothorax in 3, pleuritis with effusion in 2, bronchiectasis in 2 and middle lobe atelectasis in one. There were 4 instances of endogenous re-infection, all from cavitary lesions containing the fungus; in 3 of these there was local extension from the cavity and in the fourth a new lesion in the opposite lung after bronchoscopic interference.

The coccidioidin skin test, performed on 96 of the patients, was positive in 71. The result was negative in 15 of the cavitary cases; 11 of these were tuberculin-positive, but *Coccidioides immitis* was isolated from 3 and the remaining 8 gave no evidence of tuberculous infection.

In serological tests on 70 cases, the precipitin reaction was given with 5 (4 with pneumonia and 1 with disseminated lesions), and the complement-fixation reaction with 27, including 15 of the cavitary cases. *C. immitis* was isolated from 41 out of 91 patients; from the sputum, bronchial washings or gastric aspirates in 35, from skin lesions in 5 and pleural exudate in 1. In treatment, chemotherapy has proved ineffective, but surgical measures are being employed with increasing frequency, particularly for the treatment of residual lesions. Surgical treatment was employed in 62 of the present series of 100 patients, by resection of

cavitary lesions in 34, of nodular lesions in 25 and of nodular and bronchiectatic in one; decortication was performed in 2.

In 8 cases the question of coexisting coccidioidomycosis and tuberculosis arose; in one of these cases the evidence was strong and in 3 presumptive that this association was present. In the remaining 4 the presence of acid-fast bacilli in sputum smears was not considered sufficient evidence of tuberculosis. *J. T. Duncan*

Zilberberg, B. Pênfigo e dermatite de Duhring-Brocq. Contribuição para o seu estudo cito-histológico. [**Histological Study of Pemphigus and Duhring-Brocq's Disease**] *Arquivos de Dermat. e Sifiligrafia de São Paulo.* 1954, July–Dec., v. 16, Nos. 3/4, 43–89. 1955, Jan.–June & July–Dec., v. 17, Nos. 1/2 & 3/4, 3–42; 45–123, 89 figs. on 46 pls. [86 refs.] English summary.

The material in this very full study included 176 cases of pemphigus foliaceus. The monograph, which does not lend itself to abstraction, is profusely illustrated with photomicrographs and with case notes.
*H. J. O'D. Burke-Gaffney*

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## TROPICAL ULCER

Brown, J. S. & Middlemiss, J. H. **Bone Changes in Tropical Ulcers.** *Brit. J. Radiol.* 1956, Apr., v. 29, No. 340, 213–17, 19 figs.

The authors illustrate the bone changes which occur in the tibia and fibula in association with tropical ulcers by a series of instructive radiographs. They recognize the following stages in relatively early cases:

(1) a fusiform periosteal reaction under the ulcer which may or may not be localized;
(2) a sequestrum of the underlying cortex may form and be extruded;
(3) the surface of the bone may ulcerate.

In late stages the following may occur:—

(1) sequestration of the cortex;
(2) heaping of new bone resembling an osteoma either dense or cancellous in appearance;
(3) remote changes, often in the bone not directly affected by the ulcer. This is especially seen in the fibula as irregular widening with spicule formation;
(4) medullary changes, usually an osteoporosis distal to the ulcer:
(5) deformities due to contractures;

(6) involvement of bone by malignant disease arising in a very chronic ulcer. Such growths only rarely produce distant metastases.

The authors have only once seen osteomyelitis in association with a tropical ulcer, but Brocklebank [this *Bulletin*, 1943, v. 40, 868] noted its frequent association.

[Further observations on the occurrence of osteomyelitis and sequestra in tropical ulcers are desirable. The removal of large sequestra from patients in the tropics with chronic ulcers is a frequent event, but if these ulcers are secondary to an underlying osteomyelitis perhaps they should not be termed tropical ulcers.] *Frederick J. Wright*

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## MISCELLANEOUS DISEASES

Williams, Cicely. **Report on Vomiting Sickness in Jamaica.** pp. ii + 194, illustrated. [Numerous refs.] 1954. Kingston: Govt. Printer, Duke Street, Jamaica.

Vomiting sickness has been known to the medical profession of Jamaica for about a hundred years. Characteristically it is an acute afebrile illness of childhood with marked gastro-intestinal symptoms and a high mortality. As a result of the wide publicity given to an outbreak in 1951, the Government ordered an investigation and Dr. Cicely Williams went to Jamaica to coordinate this research. The first 80 pages of this volume are a general report by Dr. Williams and the remaining 114 pages are separate accounts of special aspects of the disease, written by doctors, botanists and chemists on the Island.

Dr. Williams opens with a general historical background of the disease and of the opinions held in Jamaica as to its cause. Poisons present in the fruit of the ackee tree and in yams have each been widely canvassed as the responsible agent. However, both ackee fruit and yams are eaten by almost all the inhabitants, often in large amounts, and no convincing toxicological studies on laboratory animals have been carried out [but see Hassall and Reyle, this *Bulletin*, 1956, v. 53, 370, published after this report was written]; so there is naturally some scepticism as to the aetiological role of hypothetical poisons from these foods. Dr. Williams was able to study numerous patients and a few outbreaks in detail. Clinical and pathological investigations established that some individual cases could be properly ascribed to acute meningitis, bronchopneumonia, heavy *Ascaris* infection and bacillary dysentery. Other outbreaks might have been reasonably attributed to influenza or staphylococcal food poisoning. Nevertheless, there were several patients in whom no definite cause could be found, despite thorough investigations. Thus a specific

poison either from the ackee fruit or yams could not be definitely excluded. If such a poison or poisons are indeed responsible, then it must be postulated that large amounts were consumed by the patients and that the patients were peculiarly susceptible to the poisons, probably on account of poor nutrition. The report confirms previous writers' statements that vomiting sickness rarely occurs except in children who are gravely undernourished.

After this account of scientifically unsatisfactory attempts to establish vomiting sickness as a specific clinical entity, Dr. Williams points out that the condition might well be wiped from off the Island by proper attention to child health. It is a disease of the sickly, underfed child. She describes the widespread irresponsibility of parents (especially the fathers) for their children and the general inadequacy of the Government medical and educational services to ensure satisfactory nutrition and care for the children. Most of the 194 pages of the report are full of doubt and uncertainties, but on pp. 76 and 77, Dr. Williams sets out succinctly and in no uncertain terms how a Maternal and Child Health Service should be organized in an underdeveloped, tropical country. Medical personnel, Hospitals, Follow-up, Health and Welfare Centres, Statistics, Legislation, Education and Social Welfare, Children's Committees—these are the paragraph headings. Paramount above all, is the role of the public health nurse. [Readers of this *Bulletin* will be familiar with these ideas already. Maybe, but the ideas have not sufficiently been put into practice. Government servants, politicians and public opinion are still not yet sufficiently alive to the place of public health in tropical development. The Jamaican Government were indeed fortunate to get Dr. Williams's advice. In these two pages she sets out, with the sure hand of a master, the ways and means not only of abolishing vomiting sickness but of the establishing of a prosperous and healthy people on the Island. It is to be hoped that this lesson will be well studied by responsible citizens in Jamaica and not allowed to lie buried in the middle of a long and otherwise somewhat arid scientific report.] *R. Passmore*

Bhargava, R. P. **An Experimental Study on the Aetiology of Lathyrism.** *J. Indian Med. Ass.* 1956, May 1, v. 26, No. 9, 338–41, 1 fig. [28 refs.]

"Lathyrism could not be produced in pigeons by pure strains of *Lathyrus sativus* (dry seeds) by feeding them at 100 per cent level for twelve weeks.

"The dry seed or flour of *Lathyrus sativus* is non-toxic. Lathyrism may be the result of consumption of germinating or damp lathyrus seeds. The condition is made worse by the lack of protective foods or may be the result of contamination with one or more toxic species of the lathyrus grain."

Dean, G. **Porphyria, a Familial Disease: its Diagnosis and Treatment.** *South African Med. J.* 1956, Apr. 21, v. 30, No. 16, 377–81, 2 figs.

In South African Europeans porphyria is a familial disorder occurring as a non-sex-linked Mendelian dominant characteristic, and nearly all the cases are descendants of one forebear who entered the country 300 years ago.

Familial porphyria causes no symptoms in childhood, although half the children of a porphyric patient inherit the disorder. Even in adults symptoms may be mild or absent, although the exposed skin tends to blister easily and scratching the back of the hand with a finger nail often causes abrasion of the superficial layer of the skin. Most males remain well, but women often complain of abdominal discomfort, particularly during pregnancy, and sometimes suffer acute attacks resembling abdominal emergencies. These are likely to be precipitated by drugs, chemicals, or alcohol. During attacks the behaviour is often emotional, and nutrition difficult to maintain; epileptiform seizures may occur.

The genealogies of 32 porphyric family groups, all of old burgher stock, were traced and 324 (168 male and 156 female) members were found to have clinical manifestations of porphyria. One of these groups was intensively investigated. The forebear, born in 1814, had had 478 descendants of whom 434 were still alive. All were eventually traced and specimens of urine obtained for examination. In the latent stage porphyria may only be detected by careful spectroscopic examination of a specimen of urine several inches deep. More precise information may be obtained by quantitative examination of faecal porphyria. In the acute stage the urine may be reddish brown, darkening on standing, and in the presence of ultraviolet light there is marked red fluorescence.

When porphyria is diagnosed treatment consists primarily in stopping all drugs, particularly barbiturates. Thiopentone anaesthesia is particularly dangerous, and gas, oxygen or ether should be used if an operation is necessary.

As the skin is photosensitive 5 per cent. tannic acid in a vanishing cream should be used before going outdoors.

During an acute attack the patient requires good nursing preferably in hospital and a high-protein, high-carbohydrate diet with high fluid content is helpful. Corticotrophin or cortisone also helps them, being given in a dose of 25 mgm. every 6 hours for 2 or 3 days and then half this dose for a similar period. Convulsions can be controlled by 30 per cent. ether in oil in a rectal drip combined with Epanutin (1½ grains every 6 hours) through a stomach tube.

Once a case has been diagnosed the family history should be fully investigated. [See also this *Bulletin*, 1956, v. 53, 808.]

*H. T. H. Wilson*

KOERBER, R. & LINHARD, J. L'éosinophilie à Dakar. Action de l'A.C.T.H. sur quelques grandes éosinophilies. [**Eosinophilia in Dakar. Action of Corticotrophin on Cases of Marked Eosinophilia**] *Bull. Soc. Path. Exot.* 1955, v. 48, No. 5, 714–34, 3 figs. [11 refs.]

The following is a translation of the authors' summary:—

Eosinophilia has been studied among different communities in Dakar: in Europeans, 30 per cent. of the subjects had an eosinophilia above 5 per cent.; in Africans, the proportion was between 58 and 70 per cent.

Eosinophilia exceeding 25 per cent. was found in 1·2 per cent. of Europeans and 3·5 to 4 per cent. of Africans.

The percentages of persons harbouring intestinal parasites, detected by a single examination, were 9·88 per cent. in Europeans and 25·22 per cent. in Africans.

The reaction to corticotrophin of eosinophilia above 25 per cent. was variable. Multiple injections generally caused a moderate and fleeting fall in the level of eosinophils.

Thorn tests showed an increase of eosinophils in 2 cases and a fall in 4, of which 2 fell to a percentage of 50 per cent.

In all cases where repeated examination could be made, with one exception, an old-standing or recent parasitic infection could be found.

*H. J. O'D. Burke-Gaffney*

BERRY, J. N., SUR, A. M. & CHAKRAVARTY, A. **Pulmonary Eosinophilia in Children.** *Indian J. Child Health.* 1956, Apr., v. 5, No. 4, 157–68. [12 refs.]

A full study of 162 cases in Nagpur.

DE SMET, M. P. Observations cliniques de tumeurs malignes des tissus réticuloendothéliaux et des tissus hémolymphopoiétiques au Congo. [**Clinical Observations on Malignant Tumours of the Reticulo-Endothelial System in the Belgian Congo**] *Ann. Soc. Belge de Méd. Trop.* 1956, Feb. 29, v. 36, No. 1, 53–70, 8 figs. on 4 pls. [35 refs.]

The English summary appended to the paper is as follows:—

" Observing 94 cases of cancer in 23,400 patients (one case in 249 sick negroes), the author, like the clinicians of Mulago hospital (Kampala, Uganda) is surprised at the frequence of reticuloendothelial tumors. After demonstrating the cases, he discusses the difficulties of diagnostic with tuberculosis.

" Because of his 4% mortality rate and the insufficiency of cancer treatment in his private clinic, the author proposes the establishment of an anticancer centre equipped with röntgentherapy."

British J. Cancer. 1955, Dec., v. 9, No. 4, 528–38, 12 figs. (4 on pl.). [17 refs.] **The Aetiology of Respiratory Tract Cancer in the South African Bantu. Part I. Clinical Aspects** [Keen, P., de Moor, N. G., Shapiro, M. P. & Cohen, L.]. **Part II. Chemical Identification of Carcinogens** [Cooper, R. L. & Campbell, J. M.].

During 1949–54, 86 cases of respiratory tract cancer in African patients were referred to the Radiotherapy Department of the Johannesburg General Hospital, making 7 per cent. of all malignant tumours seen. They were drawn from a population of about 2,000,000 Transvaal Bantu, one-quarter of whom are urbanized. A table shows the differences between the anatomical distribution in the Bantu and in 140 European patients; the nose and accessory sinuses were the site of the growth in 54 per cent. of the cases in the Bantu against 5 per cent. in Europeans, the lungs were the site in 17 per cent. against 67 per cent., while for the larynx and nasopharynx there was little difference between the two groups; the region of the maxillary antrum seemed to be the site of origin in 39 of the 46 cases.

Cancer of the nose and paranasal sinuses accounts for 4 per cent. of all malignant tumours in Africans referred for therapy, but for only 0·4 per cent. of European radiotherapy cases in Johannesburg. The incidence of nasal and antral tumours in other pigmented races is not significantly greater than in the European (Khanolkar, *Acta Union Internat. contra Cancrum*, 1951, v. 7, 51; Kouwenaar, *ibid.*, 61), so the high prevalence in the Bantu is presumably dependent on local conditions. The average age of the patients in this series (52 years) is lower than that reported in a similar series in Europeans (59 years), but there is no marked difference in age-susceptibility between nasal and bronchial cancer to account for the large racial difference found. The sex ratio was 85 per cent. males in the whole series and was similar to that found in the corresponding tumours in Europeans.

Dietary factors are probably not of importance in the aetiology, nor is atmospheric pollution from fuels, though the Witwatersrand is exposed to dust from the gold-mining industry, containing silica, cyanide and possibly uranium. The consumption of cigarettes by Africans is a recently acquired habit limited by economic considerations, a factor which would explain the lower incidence of lung cancer in the Bantu group. On the other hand the Bantu tribes of the Transvaal and Natal use extensively a form of snuff prepared from indigenous plants. Most of the patients in this series of cases came from primitive peasant communities, among whom snuff-taking is a universal habit of the older generation and plays an important part in tribal ceremonies and customs, the habit being started in the early twenties. The snuff is a mixture of tobacco and usually aloe and was found to contain 3:4-benzpyrene; it is very irritating to the nasal mucosa and practice with milder mixtures is necessary before tolerance is acquired.

Part II gives an account of photospectometric methods of analysis of the snuff. An abstract, dealing with this aspect, has already been published in this *Bulletin*, 1956, v. 53, 666.

[Digby (*Brit. J. Surg.*, 1941, v. 28, 517) reported that 18 per cent. of cancers seen in Hong Kong in Chinese were epidermoid cancer of the nasopharynx and similar findings have been reported in Chinese in Singapore. It is attributed to the effects of smoke in unventilated huts.]

*W. L. Harnett*

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## PARASITOLOGY: GENERAL

Kozar, Z. & Szymańska, Helena. **Epidemiological Investigations on Intestinal Parasites among the Sick of Psychiatric Hospital.** *Bull. State Inst. Marine & Trop. Med. Gdańsk, Poland.* 1956, v. 7. 177–8. [Also fuller version in Polish 169–75 & in Russian 176–7.]

——————— & ———————. **A Contribution to the Frequency of Incidence of Intestinal Parasites among the Rural Children of the Gdańsk Districts.** *Ibid.*, 185–6. [Also fuller version in Polish 179–83 & in Russian 184–5.]

Simitch, T. & Petrovitch, Z. La faune des parasites intestinaux en Yougoslavie. II.—La faune des helminthes intestinaux chez les enfants d'âge scolaire. [**Intestinal Parasites in Yugoslavia. II. Intestinal Helminths in Schoolchildren**] *Arch. Inst. Pasteur d'Algérie.* 1955, Sept., v. 33, No. 3, 264–8.

The authors' summary in French is freely translated as follows:—

To determine the geographical distribution and frequency of intestinal helminths of man in Yugoslavia, we examined the stools of 7,266 schoolchildren from 133 localities, in different regions in this country. These children had previously been examined for intestinal protozoa [see this *Bulletin*, 1956, v. 53, 373].

The helminth eggs were sought for by 3 different methods: examination of adhesive Cellophane applied to the anal folds, examination of direct smears and of faeces treated by an egg-concentration method. Eggs of the following helminths were found: *Taenia saginata*, *Hymenolepis nana*, *Enterobius vermicularis*, *Ascaris lumbricoides*, *Trichuris trichiura* and *Trichostrongylus* sp. The geographical distribution of these helminths varies from one region to another in the country as well as from place to place in one region. The incidence of *T. saginata* in schoolchildren

varies from 0 to 6·1 per cent.; of *H. nana*, from 0 to 39·2 per cent.; of *E. vermicularis*, from 25 to 100 per cent.; of *A. lumbricoides*, from 0 to 100 per cent.; of *T. trichiura*, 0 to 97·5 per cent.; and of *Trichostrongylus* sp., from 0 to 14·2 per cent. *J. J. C. Buckley*

Wells, W. H. & Blagg, W. **A Survey of Human Intestinal Parasites in a Fishing Village of Northern Egypt.** *Amer. J. Trop. Med. & Hyg.* 1956, Mar., v. 5, No. 2, 266–8.

"Twenty-one species of intestinal protozoa and helminths were recorded in the examination of single fecal specimens from 367 school children living in an isolated fishing village in northern Egypt. *Entamoeba histolytica* was found in 49 per cent of the children. Eggs of *Schistosoma mansoni* and *Schistosoma haematobium* were found in 34 per cent and 6 per cent respectively of the stools. The intestinal trematode *Heterophyes heterophyes* was a common parasite, with an incidence of 36 per cent recorded."

Brooke, M. M., Swartzwelder, C., Payne, F. J., Weinstein, P. & Frye, W. W. **Intestinal Parasite Survey of Korean Prisoner-of-War Camp.** *U.S. Armed Forces Med. J.* 1956, May, v. 7, No. 5, 708–14. [11 refs.]

"During the summer of 1951, 1,726 Korean prisoners of war on the Island of Koje (Korea), were examined for intestinal parasites. Portions of a single, normally passed stool per person were preserved in two vials, one containing 10 per cent formalin and the other PVA-fixative. The formalin-ether sedimentation technic was performed on the first portion and a permanently stained film (iron hematoxylin) was prepared from the second. A total of 1,682 prisoners (97·5 per cent) were found to be infected with one or more species of protozoa or helminths. The prevalence rate for *E. histolytica* was 33·9 per cent.

"The formalin and polyvinyl alcohol fixative technics for stool preservation, and the formalin-ether sedimentation and the permanently stained films for examination, constituted an efficient method of conducting surveys for intestinal parasitic infections."

Lamy, L. & Benex, Jacqueline. Modification de technique de coproculture pour helminthes et protozoaires. [**Modification of Culture Method for Helminths and Protozoa in Faeces**] *Bull. Soc. Path. Exot.* 1956, Jan.–Feb., v. 49, No. 1, 43–4, 1 fig. on pl.

The culture is prepared by washing rabbits faeces to remove gross debris and to moisten them, after which they are ground and placed in

layers of about 1 cm. in Petri dishes. The dishes, wrapped in filter paper, are autoclaved for 20 minutes at 120°C. and kept in the refrigerator.

For use, a piece of the test material about the size of a bean is placed in the centre of the culture dish and mixed with the medium over an area of about 3 to 4 cm. in diameter, so that the subsequent test samples may be taken from the edge. The culture dish is incubated at 25°C. in its original wrapping. No preservatives are added.

After 4 or 5 days, a sample about the size of a grain of wheat is taken from the edge of the culture, diluted with a little water and examined under a coverslip.

The authors have obtained good development of ankylostome and *Strongyloides* larvae in this way, and have obtained a complete cycle of the latter worm from chimpanzees (the various stages are shown in photomicrographs). They have also obtained development of sporozoites from coccidial oöcysts of rabbits and other animals by this method.

In one case, the stool of a European patient from Guadeloupe examined in this way for *Strongyloides* showed abundant development of *Trichomonas*, and similarly *Chilomastix* developed in a specimen of rabbit faeces, which was under examination for coccidia.

*H. J. O'D. Burke-Gaffney*

See also p. 1188, Ridley & Hawgood, **The Value of Formol-Ether Concentration of Faecal Cysts and Ova.**

Vivell, O. Ein neues stabiles Antigen für die Serodiagnose der interstitiellen plasmazellulären Pneumonie junger Säuglinge und Frühgeburten. [**New Antigen for the Serodiagnosis of Interstitial Plasma-Cellular Pneumonia in Normal and Premature Infants**] *Deut. med. Woch.* 1955, Sept. 16, v. 80, No. 37, 1357.

In a previous paper (*Deut. med. Woch.*, 1954, v. 79, 358) the author described a new complement-fixation test for interstitial pneumonia in infants, in which the *Pneumocystis* antigen was prepared as follows: the infected lung of an infant who died of the disease was homogenized in saline (1 : 5) and the suspension was centrifuged for 30 min. at 2500 r.p.m., after which the supernatant fluid was repeatedly frozen and thawed, and used as antigen. As this antigen proved to be unstable, experiments were carried out with antigens prepared from *Pneumocystis*-infected lung by the method devised by Casals for virus antigens.

Comparative titration tests were then made with antigens prepared by the two methods from the same lung against immune serum taken from the patient shortly after death, and with various dilutions of each. It was found that the " Casals antigen " reacted strongly with the immune serum, whereas the " frozen antigen " produced no reaction. Moreover,

the former preparation can be preserved by dry-freezing without losing its potency for at least 2 months. *C. A. Hoare*

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## ENTOMOLOGY AND INSECTICIDES: GENERAL ZOOLOGY

[Papers on the toxic effects of insecticides in man are abstracted in the *Bulletin of Hygiene* under the general heading of Occupational Hygiene and Toxicology.]

La Face, Lidia. Gli studi entomologici di Battista Grassi. [**The Entomological Studies of Battista Grassi**] *Rendiconti Istituto Superiore di Sanità.* Rome. 1956, v. 19, Pts. 2/3, 196–225.

Pratt, H. D. **A Check List of the Mosquitoes (Culicinae) of North America (Diptera: Culicidae).** *Mosquito News.* 1956, Mar., v. 16, No. 1, 4–10. [Numerous refs.]

This check list is intended to bring up to date Matheson's *Handbook of the Mosquitoes of North America* (Ithaca, Comstock Publ. Co.). Several species are added, and changes in synonomy are discussed. The mosquito fauna consists of 138 species, 3 with subspecies, distributed in 11 genera (*Anopheles*, 14 species; *Toxorhynchites*, 1 sp.; *Wycomyia*, 4 sp.; *Uranotaenia*, 3 sp.; *Aëdes*, 61 sp.; *Culex*, 27 sp.; *Culiseta*, 7 sp.; *Deinocerites*, 2 sp.; *Mansonia*, 3 sp.; *Orthopodomyia*, 3 sp.; *Psorophora*, 13 sp.). Adult males, females and fourth instar larvae are known of 136 species, the immature stages of *Aëdes muelleri*, and the male and immature stages of *Psorophora mexicana* being unknown. Notes are given on problems of distribution and taxonomy needing further investigation in North America. *B. R. Laurence*

Richards, C. S., Nielsen, L. T. & Rees, D. M. **Mosquito Records from the Great Basin and the Drainage of the Lower Colorado River.** *Mosquito News.* 1956, Mar., v. 16, No. 1, 10–17, 1 fig. [15 refs.]

This area is characterized by desert vegetation and less than 10 inches of rainfall a year. Records are given of mosquitoes from Arizona, Nevada, Utah and east central California, most records being of mosquitoes inhabiting the desert plains and valleys, although mosquitoes from higher altitudes are included. Altogether, 22 species of *Aëdes*, 3 of *Anopheles*, 13 of *Culex*, 4 each of *Culiseta* and *Psorophora*, and 1 each of *Mansonia*, *Orthopodomyia* and *Uranotaenia* occur in the region and their distribution is given in detail by county and date. Previous records of *Anopheles pseudopunctipennis*, *A. quadrimaculatus*, *Culiseta impatiens* and *C. melanura* are regarded as uncertain or invalid. *B. R. Laurence*

Labrecque, G. C., Noe, J. R. & Gahan, J. B. **Effectiveness of Insecticides on Granular Clay Carriers against Mosquito Larvae.** *Mosquito News.* 1956, Mar., v. 16, No. 1, 1–3.

Carrier granules were impregnated mainly by using acetone solutions of insecticides. Various solvents with high and low volatility were tested and found to be equally satisfactory. The granules were dropped into 900 cc. of water; 25 fourth-instar larvae were added; and mortality counts were taken after 24 and 48 hours. Used against *Anopheles quadrimaculatus* diatomite (Pyrax ABB) and pyrophyllite (Celite 408) impregnated with 1 per cent. dieldrin produced slightly greater mortality than similarly impregnated attapulgite (Florex S and Attaclay A) and bentonite (Volclay) particles. No optimum particle size was demonstrated. Against *Aëdes aegypti* diatomite was the most effective carrier, and larvae were more resistant than larvae of *A. quadrimaculatus* to dieldrin on the other carriers. Combinations of attapulgite and bentonite, in different proportions, impregnated with 1 per cent. dieldrin, used against *A. quadrimaculatus* showed no optimum effective combination. Dieldrin was found to have diffused equally through water to which an impregnated 25 to 75 attapulgite-bentonite mixture had been added without stirring.

Tests against *A. quadrimaculatus* with the use of 25 insecticides on attapulgite showed parathion and EPN to be highly effective (mortality greater than 85 per cent. in 48 hours) at 0·01 p.p.m. Field trials against *A. quadrimaculatus* and *A. crucians* with the use of the most effective insecticides on attapulgite granules showed that parathion, EPN and Bayer 21/199 were highly effective at 0·01 pounds/acre.

*B. R. Laurence*

Fales, J. H. & Bodenstein, O. F. **Effectiveness of Synergized Allethrin and Pyrethrum Sprays against Mosquitoes.** *J. Econom. Entom.* 1956, Apr., v. 49, No. 2, 156–8. [14 refs.]

"In spray tests against the mosquitoes *Aedes aegypti* (L.) and *Anopheles quadrimaculatus* Say, piperonyl butoxide, sulfoxide, propyl isome, and MGK-264 were compared as synergists for both allethrin and pyrethrins.

"Against *Aedes* piperonyl butoxide was the most effective when used with pyrethrins, but sulfoxide and propyl isome also gave good synergism. MGK-264 caused no synergism. With allethrin the degree of synergism was not as great as with pyrethrins. MGK-264 again caused no synergism, but the others were nearly equal.

"Against *Anopheles* when the synergists were used with pyrethrins the results were similar to those against *Aedes*. With allethrin, however, MGK-264 was equal to piperonyl butoxide and sulfoxide and propyl isome was slightly more effective. Three of the synergists were ineffective when tried alone whereas MGK-264 showed slight toxicity."

Cova Garcia, P. & Suarez, O. M. Estudio sobre la Morfología de la mosca doméstica. [**Study of the Morphology of** *Musca domestica*] *Rev. Sanidad y Asistencia Social.* Caracas. 1953, Sept.–Dec., v. 18, Nos. 5/6, 887–919, 3 figs. on 3 pls. [14 refs.] English summary.

The authors review earlier opinions of the status of the various forms of the *Musca domestica* complex [see Sacca, this *Bulletin*, 1953, v. 50, 1088]. They obtained specimens of house-flies from Spain, U.S.A., Italy, Greece, Egypt and locally from Maracay and Rancho Grande and made a series of measurements of different parts of the head, thorax and wings of males and females. They found the ratio of frons to head-width in the males ranged from 6·6 to 18·6, *i.e.*, from *domestica* to *nebulo* or *cuthbertsoni* type; but extremes were found in specimens from the same countries. As regards the posterior dosocentral bristles, the anterior ones were shorter in all specimens (*cuthbertsoni* type) except the Venezuelan colonies.

From these measurements it was concluded that firm distinction of the forms of *M. domestica* is not possible, because the variation is probably environmental, not genetic. Considering the possible causes, the general similarity of the two Venezuelan colonies suggests that climatic variation is not important because one came from a warm area (about 25°C.) and the other from the mountains (about 10°C. mean temp.).

Laboratory experiments, however, revealed 2 important sources of variation in the frons-head ratio. Flies reared on a sparse diet (or on overcrowded food) showed more variation, and included many very high ratios. Secondly, as flies dry up after death, the frons shrinks more than the head, so that the ratios tend to increase with the passage of time. This was more pronounced in undernourished than in well fed flies. *J. R. Busvine*

Gil Collado, J. Dipteros productores de miasis humanas en España y sus colonias. [**Diptera-Producing Myiasis in Spain and in Spanish Colonies**] *Med. Colonial.* Madrid. 1956, Apr. 1, v. 27, No. 4, 323–43, 18 figs.

Silva-Campos, R. Hallazgos de larvas de *Tubifera tenax* (*Eristalis tenax*). [**The finding of** *Tubifera tenax* (*Eristalis tenax*) **in Human Faeces**] *Bol. Chileno de Parasit.* 1955, Oct.–Dec., v. 10, No. 4, 75–7, 1 fig.

The English summary appended to the paper is as follows:—

"The finding of three specimens of *Tubifera tenax* (*Eristalis tenax*) [Hover fly], claimed by the patients to have been eliminated together with the faeces, is reported. The morphology, biology and the

mechanism of transmission of this larva, as well as clinical aspects of human intestinal myiasis are briefly reviewed."

CHARDOME, J. A. *Armillifer armillatus* à Coquilhatville. [*Armillifer armillatus* **at Coquilhatville (Belgian Congo)**] [Correspondence.] *Ann. Soc. Belge de Méd. Trop.* 1955, Oct. 31, v. 35, No. 5, 619.

The author reports briefly the finding of 25 cases of pentastome infection in about 5,000 post-mortem examinations of the lungs and abdomen. He has often suspected the presence of calcified larvae in the lung, where they are not typical and may be confused with other calcifications; confirmation was often found in the abdomen, where they are numerous.

The findings were mostly in Africans who eat snakes, which are the usual intermediate hosts of *Armillifer*, and the relatively high incidence is probably due to the fact that most of these persons lived in marshy areas where the snakes abound.

One case was also seen in a European who had lived for 10 years in the Province. The infection is evidently commoner than has been supposed. *H. J. O'D. Burke-Gaffney*

BOLAM, R. M. & BURTT, E. T. **Flea Infestation as a Cause of Papular Urticaria. A Preliminary Investigation.** *Brit. Med. J.* 1956, May 19, 1130–33, 6 figs. [16 refs.]

By the investigation of 30 cases of papular urticaria occurring in children of up to 10 years of age, the authors have indicated strong reasons to incriminate domestic fleas as a causal agent. Visits were made to the homes concerned, where search was made for evidence of fleas, either as developmental stages of the fleas or in the form of soiled bed-linen, etc. In 21 cases fleas were found and identified, either from adults collected, or by rearing from eggs or larvae (collecting and rearing techniques are described). The species found (number of cases involved and normal host following in parentheses) were: *Ctenocephalides felis* (15; cat), *Ceratophyllus gallinae* (2, plus 1 mixed infestation with *Ct. felis;* hen), *C. columbae* (1; pigeon), *C. farreni* (1; house-martin), *Pulex irritans* (1; man), unidentified (1). All of the species named are liable to enter houses, either with their normal host (*e.g., Ct. felis, P. irritans*) or more or less accidentally (especially from adjacent birds' nests). The low incidence of *P. irritans* is attributed partly to the known decline of this species in recent years, and partly to its not having been detected. In 2 of the 9 cases in which fleas were not found, there was strong circumstantial evidence favouring flea infestation. The fact that frequently some members of a family were free from urtication was attributed to individual differences in allergy to flea bites.

Disinfestation of houses and pets by insecticides gave rapid improvement in all cases, and in 14 of them all signs of the urticaria disappeared. Other suggested means of control centre around the segregation of animals kept as pets, and the removal of dust and debris of all types. Three case-histories are given in detail. *N. R. Phillips*

Dias, J. A. T. S. Sur quelques tiques d'Angola en collection dans le Musée d'Histoire Naturelle de Londres. [**Some Ticks from Angola in the Collection in the British Museum (Natural History)**] *Bull. Soc. Path. Exot.* 1956, Jan.–Feb., v. 49, No. 1, 68–71.

———————. Notes sur quelques ixodidés d'Angola en collection dans le laboratoire de parasitologie de la Faculté de Médecine de Paris. [**Some Ixodid Ticks from Angola in the Collection in the Parasitology Department of the Faculty of Medicine in Paris**] *Ibid.*, 65–8.

Théodorides, J. Notes sur des coléoptères d'importance médicale (troisième série). [**Notes on Coleoptera of Medical Importance (Third Series)**] *Méd. Trop.* Marseilles. 1956, Jan.–Feb., v. 16, No. 1, 101–5, 1 fig. [12 refs.]

The author reviews recent papers on beetles of medical interest, and also records similar cases brought to his notice [see also this *Bulletin*, 1952, v. 49, 731; 1955, v. 52, 100]. Twenty-eight species are mentioned, belonging to 10 families. Further records are given of beetles (*Paederus*, *Lydus*, *Tribolium*), or their larvae (*Necrobia*, *Bruchus*), causing sensitivity on contact. Other records include coprophagous beetles as possible vectors of helminths, cantharidin poisoning due to taking an infusion of the Meloid beetle *Mylabris oleae*, and survival of the Columbia SK virus in *Tenebrio molitor*. *B. R. Laurence*

Lofgren, C. S. & Cutkomp, L. K. **Toxicity of DDT to the American Cockroach when Lipid Content and Temperature are varied.** *J. Econom. Entom.* 1956, Apr., v. 49, No. 2, 167–71, 6 figs. [17 refs.]

See also p. 1140, Halawani & Latif, **B-Nitrostyrene: a Snail and Insect Poison.** (A Preliminary Report.)

## LABORATORY PROCEDURES

Ridley, D. S. & Hawgood, B. C. **The Value of Formol-Ether Concentration of Faecal Cysts and Ova.** *J. Clin. Path.* 1956, Feb., v. 9, No. 1, 74–6.

The authors describe their modification of Ritchie's formol-ether method for concentrating cysts of protozoa and eggs of helminths in the routine diagnosis of human intestinal parasites. The procedure is as follows. About 1 gm. faeces is emulsified with 7 ml. of 10 per cent. formol-saline and strained through wire gauze (= 40 mesh per inch) into a centrifuge tube, to which 3 ml. ether are added, after which the mixture is shaken for 1 min., centrifuged for 2 min. at speeds gradually increasing to 2,000 r.p.m. and allowed to come to rest. After the debris is loosened the supernatant is decanted, leaving 1–2 drops in the tube; then the deposit is shaken and poured out on a slide for examination.

This technique, which is said to be better than the other concentration methods in current use, has the following advantages: (a) the whole procedure occupies only 5 min.; (b) the concentration is about 20–30 times, and (c) there is complete absence of distortion of the parasitic cysts and ova.

A comparison was made of the results of direct examination and of concentration of the faeces from 670 unselected patients at the Hospital for Tropical Diseases in London. The number of infections detected by the new concentration method was 2 and 3 times greater than that found by direct examination of faecal smears, in the case of cysts and ova respectively. Moreover, in every case when these were found in the smear they were also recovered in the concentrate.

In the case of amoebae, the concentration method is suitable only for the demonstration of cysts, for the trophozoites are destroyed by this technique. The free amoebae should therefore be sought for in fresh faecal smears, especially in specimens from soft stools with blood and mucus, since in the authors' experience they cannot be detected by microscopical examination of formed stools.

An observation is recorded in which diagnosis of schistosomiasis in 33 cases was made by the concentration of stools and by examination of rectal snips. Both methods proved to be equally effective.

*C. A. Hoare*

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## MISCELLANEOUS PAPERS

Manson-Bahr, P. **Tropical Diseases affecting the Throat, Nose and Ear.** *J. Laryngol. & Otol.* 1956, Apr., v. 70, No. 4, 175–95, 18 figs.

Sir Philip Manson-Bahr draws on the wealth of his clinical experience and on the resources of the Wellcome Museum of Medical Science to

give a very readable and well illustrated account of tropical diseases affecting the throat, nose and ear. The article is presumably primarily intended to interest otorhinolaryngologists in the manifestations of tropical diseases in their specialized field and in this it admirably succeeds. The author also touches on the modifications of ubiquitous disease which may occur in the tropics and rightly warns that asthma is common in some tropical countries and the effect of changes of climate and environment on many asthmatics is unpredictable and by no means always favourable.

[No mention is made of tonsillar plague, faucial anthrax, dental fluorosis, or of a curious and progressive atrophic condition of the mouth seen in Indians in Kenya and described by SCHWARTZ as "atrophia idiopathica (tropica) mucosae oris".] *Frederick J. Wright*

BLANC, G. Conservation dans la nature de virus pathogènes pour l'homme. Une observation marocaine. [**Natural Reservoirs of Organisms Pathogenic for Man; Observations in Morocco**] *Maroc. Méd.* 1955, July, v. 34, No. 362, 933–7.

There is first a brief historical account of the realization that animals could be reservoirs of diseases of man, and that the organisms concerned need not always be pathogenic to the animal host. The principles are related to several of the now well-known relationships of this kind. This is followed by an account of particular circumstances in a forest reserve 33 kilometres from Casablanca. The reserve is also used for game-shooting and is much used also by campers and day visitors. Rabbit (*Oryctolagus cuniculus*), hare, jackal, and hedgehog are the commoner animals observed, and there are partridges. Cattle consist of a very few cows owned by forest guards.

Very large numbers of *Hyalomma excavatum* are to be seen running about on the ground and on to people's clothing, particularly in the warm weather. The rabbit is an important host of this tick and *Rhipicephalus sanguineus* also occurs on rabbits in less numbers. An organism, resembling that of Q fever by laboratory test, was isolated from wild-caught *Hyalomma* and demonstrated in up to 44 per cent. of the rabbits, but this organism produces transient fever but not pulmonary involvement in human infections. The rabbits were also infected with murine typhus but a less virulent form for rats and man than the strains from rats. Transmission between rabbits seems possible by *Xenopsylla ramesis* which is readily susceptible to infection and very abundant in rabbit burrows. The rabbit-flea, *Spillopsyllus cuniculi*, may be too sessile on the host to be a satisfactory vector. A relapsing fever spirochaete (*Spirochaeta hispanica*) was also isolated from the rabbits of this forest reserve and also in the ticks, *Ornithodorus erraticus*, found in most rabbit burrows.

Failure of *Hyalomma* to become attached and properly engorged, as a

rule, on people, and infrequent association of fleas and the *O. erraticus* in rabbit burrows with visitors to the reserve seem to minimize the risk of human infections from these several disease organisms isolated from the rabbits and from their vectors. *D. S. Bertram*

Haneveld, G. T. **Injuries caused by Garfish-Like Fishes in Netherlands New-Guinea.** *Documenta Med. Geograph. et Trop.* Amsterdam. 1956, Mar., v. 8, No. 1, 96–8.

Garfish (*Tylosurus*, related to the Belonidae) occur in waters from the African coast to the Pacific islands. They are long silvery fish which may reach 3 to 6 feet in length, they move swiftly just below the surface of the water and tend to leap out of the water, especially towards a light. The long jaws are elongated to a beak and " are set with a row of small, pointed teeth and a row of more widely spaced long, needle-like teeth ". Fishermen and bathers in the Bay of Hollandia, New Guinea, are often attacked by these fish and severe laceration may occur. A related family, the " half-beak " (Hemirhamphidae) have only an elongated lower jaw and do not seem to cause such injuries.

The author discusses the scanty literature on injuries caused by these fish and describes briefly 2 such cases, one in a child of 3 and one in a fisherman of 35. In both cases the wounds healed and the patients responded to orthodox methods of treatment.

*H. J. O'D. Burke-Gaffney*

Gilles, H. M. & Scott, J. G. **Serum Iron in Gambian Africans.** *Ann. Trop. Med. & Parasit.* 1956, Mar., v. 50, No. 1, 103–4.

The authors estimated the serum iron in 31 male and 19 female Africans in the Gambia. Only those volunteers were chosen who were free from physical signs, fever or parasitaemia and whose haemoglobin was at least 12 gm. per cent. Blood samples were taken in the morning on fasting subjects.

The results are shown in a table and compared with those in Europeans and in American Negroes reported by other workers. Serum iron in the Gambian subjects averaged, in males and females respectively, 106 and 98 μgm./100 ml., with ranges of 72 to 168 μgm./ml. and 74 to 150 μgm./ml. Values of European volunteers in the Gambia agreed closely with these findings. Clearly the serum-iron values were within normal range, despite the unusually high iron content of Gambian drinking water and cereals recorded by Walters and Waterlow [this *Bulletin*, 1955, v. 52, 395]. The high figures for serum iron recorded by Gerritsen and Walker in some Bantu males [*ibid.*, 1953, v. 50, 868] were not encountered.

The authors propose to use these results as the basis for studies on serum-iron changes in *Plasmodium falciparum* malaria.

*H. J. O'D. Burke-Gaffney*

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## REPORTS AND SURVEYS

East Africa High Commission. **East African Medical Survey and Research Institute Annual Report No. 6, 1954–1955.** 44 pp. 1955. Nairobi: Govt. Printer.

Professor C. A. Bozman writes this report while Acting Director between the resignation of Lt. Col. W. Laurie, and his successor—Professor E. G. Holmes—taking up his appointment. The report covers the period January 1 to June 30, 1954 so that future reports will coincide with financial years. The Filariasis Research Unit was absorbed into the East African Medical Survey during this period. It is recorded, sadly, that no statistician has yet been engaged. A tribute is paid to Lt. Col. Laurie's work, which will end only when he has completed the writing up of the survey results of his time (summaries are given of the monographs already completed).

*Dietary Survey.* The summary includes tables of dietary intake in some areas of Kwimba, Sukumaland.

*Kisii Survey.* Statistical analysis of this survey was undertaken by the Statistical Department of Kenya, and the summary is the lengthiest and most informative part of the report, giving much textual detail on marital condition, fertility, abortions and still births, infant and child mortality, followed by 24 statistical tables. The total fertility rate was calculated by several methods, and the results, which tallied well, indicate that there is "little relative error if a level of 7·5 is taken. Since 49 per cent of the births were female this gives a gross reproduction rate of 3·7. . . ." One of the tables gives deaths in age-groups from 100 live births as:— less than 1 year, 22; 1–4 years, 15; 5–14 years, 7; total under 15, 44.

Summaries of reports on the Buha and Msambweni Surveys are given in more general form. During the latter an enquiry was made into the association of malaria and the sickle-cell trait, the results of which are to be published in the medical press. In the Taveta-Pare area the East African Medical Survey cooperated in an anti-malarial scheme under the East African Malaria Unit. Local investigations included a systematic school health survey, which is to be carried on as a long-term project [out of which very interesting data may be expected]. First examinations revealed high rates of blood and intestinal parasitism. An experiment was in progress, the object of which is to see if a dam can be kept snail-free with copper sulphate.

Closure of the Filariasis Research Unit as a separate entity has not meant cessation of work. The general survey of filariasis in Tanganyika was completed in 1954. There is a discussion of some length on bancroftian filariasis and elephantiasis, and it is concluded that in Tanganyika hydrocele is possibly more important even than elephantiasis. It is not always possible to incriminate *Wuchereria bancrofti* infection as the certain cause of elephantiasis.

Finally, an account is given of the follow-up of an onchocerciasis enquiry begun in 1953 in Kakamega. Both diethylcarbamazine and Neostibosan treatment gave results which can be described as promising [but unless more details can be published, one cannot say that any new light has been shed on the treatment of onchocerciasis]. *B. B. Waddy*

Central Office of Information. Reference Pamphlet 12. **Health in the United Kingdom Dependencies.** 38 pp. [Refs. in footnotes.] 1956. London: H.M. Stationery Office. [2s.]

Sections of this monograph are devoted to the major diseases, malaria, leprosy, trypanosomiasis, yellow fever, yaws, venereal diseases, tuberculosis, diseases causing blindness, and other diseases. There are chapters on social and preventive medicine, nutrition, and organization of health services. A factual account is given of all organizations concerned with the health of dependencies; the mere list of these organizations, in the United Kingdom, in the dependencies themselves, and international and interterritorial bodies, makes impressive reading.

A statistical appendix gives the following tables:—

I. Decline in deaths due to malaria, tuberculosis, and other parasitic or infective diseases (for 6 Colonial territories);

II. Expansion of health facilities, 1950–54 (for 16 territories);

III. Decline in infant mortality rates, 1935–39 compared with 1950–54 (for 13 territories);

IV. Population increases, 1921 or 1931 to 1952, 1953 or 1954 (for 39 territories);

V. Expectation of life (for 9 territories).

[The best possible case is made for the effort to improve health, and social wellbeing in connexion with health, in the dependencies. Critical examination of the statistical tables, however, reveals how much of the basic raw material of health progress, *i.e.*, vital statistics, has still to be obtained. The tables apply only to a selection of territories, and footnotes give remarks such as " mainly estimates " and " these statistics are unreliable ". In the text, more use might have been made of statistics which are available, or references might be given by which these statistics could readily be found. To take one example, it is stated " In Trinidad nearly 90,000 houses were sprayed in 1954 and the death rate from malaria is falling steadily ". Figures of the falling death rate

would convince. Figures of the number of houses sprayed, followed by an unsupported statement of the effects, evoke merely the noise of an overblown trumpet. Where existing statistics are used, for example in surveying Nigeria's effort against sleeping sickness, they provide the most convincing reading in the whole monograph, which (subject to the one criticism above) provides a comprehensive and valuable survey of its subject.] *B. B. Waddy*

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## BOOK REVIEWS

MARTIN, Eric W. & COOK, E. Fullerton [Edited by]. **Remington's Practice of Pharmacy. A Treatise on the Manufacturing, Standardizing, and Dispensing of Pharmaceutical Products, with Biological and Chemical Properties, Tests for Purity, Assays, Uses, and Doses; also a Guide to the Legal Obligations of the Pharmacist and the Professional Services rendered in helping to maintain Community Health. A Textbook and Reference Guide for Pharmacists, Physicians, and other Medical Scientists.** 11th Edition. pp. xii + 1707, numerous illustrations. 1956. Easton: The Mack Publishing Co., Pennsylvania, U.S.A. London: Interscience Publishers Ltd., 88–90, Chancery Lane, W.C.2. [$18.00; £6. 15. 0.]

This book is described on the title page as " a treatise on the manufacturing, standardizing and dispensing of pharmaceutical products, with biological and chemical properties, tests for purity, assays, uses and doses; also a guide to the legal obligations of the pharmacist and the professional services rendered in helping to maintain community health ". The enthusiasm and industry of the 2 editors, 4 associate editors and more than 200 contributors have produced an encyclopaedia of 1707 pages which weighs 9¼ lb.—¼ lb. more than the 10th edition.

The introductory section contains a history of pharmacy, biographies of famous American pharmacists, and a guide to pharmaceutical literature and research. An extensive section on physical pharmacy begins with weights and measures, elementary mathematics and the measurement of physical constants. There follows an account of various pharmaceutical processes such as grinding, extraction and sterilization; for all of these, the underlying physical principles are fully described. The third part of the book describes the preparation of solutions, tablets, pills and injections, both on a small scale and in the factory.

Part IV is devoted to inorganic chemistry, and is arranged according to the periodic table. Each compound of pharmaceutical interest is described under the appropriate group of elements, together with its pharmacopoeial standards, action, uses and dose. The last chapter of

the section deals with radioactive elements, and includes a general account of the use and determination of radio-active isotopes.

Part V, which covers 575 pages, is a textbook of organic pharmaceutical chemistry. It covers general organic chemical reactions and the methods of synthesis of medicinal substances; short monographs give standards and uses for each drug. The substances are arranged according to chemical structure and pharmacological action somewhat in the manner of the *National Formulary*. New and synthetic remedies are to be found under the headings of older natural products—thus synthetic antimalarials are an appendix to a section on the cinchona alkaloids, and pethidine and methadone are described with the opium alkaloids. There are extensive chapters on vitamins, hormones and antibiotics.

Subsequent parts deal with the preparation of vaccines and sera, physical and chemical analysis, biological assays and statistics.

Part VIII is upon professional pharmacy in the United States—the organization of dispensaries, prescriptions, forensic and hospital pharmacy, dental, surgical and veterinary supplies, first aid and pest control.

An appendix gives a selection of formulae for such things as inks, floor polishes, stain removers, lotions, deodorants and perfumes. There are 920 illustrations, most of which are useful and well produced. The type and the setting of the structural formulae are excellent and the index is fair.

The information given upon the actions of drugs used in tropical medicine is often out of date, and sometimes erroneous. It bears the stamp of insufficient care in the revision of a previous edition. Thus, on p. 945, leishmaniasis and granuloma inguinale are both ascribed to "a protozoan, *Leishmania donovani*", and aureomycin is recommended as less toxic than antimony for use in schistosomiasis, filariasis, leishmaniasis and granuloma inguinale. Emetine is considered to be a very toxic substance, and the old error that "the percentage of cures [in amoebiasis] is below 15 per cent, since cysts are little affected" (p. 925) remains uncorrected. Carbarsone is recommended as "probably the most useful, potent, and safe *antiprotozoan* arsenical drug used in the therapy of *intestinal amebiasis*" (p. 947). Mel B is said to be "a new drug and not generally available" (p. 950). In spite of the voluminous literature on the use of pentamidine in trypanosomiasis, and the withdrawal of stilbamidine, it is stated: "the actions and uses of *propamidine* and *pentamidine* are similar to stilbamidine, but they are more toxic" (p. 829). Under suramin is written: "serious side-effects, including dermatitis, cutaneous hemorrhages and agranulocytosis, may develop" (p. 829). It is made to sound an extremely dangerous drug. *Wuchereria* is spelt *Wucheria* throughout.

Many such examples could be quoted, and it is clear that the book is not trustworthy as a work of reference in this field.

The general scientific sections of the book appear to be well planned and concise, and—if he is strong enough to carry this enormous book

about with him—of value to the American pharmacy student. The sections covering the public relations of the pharmacist, and his work in the world outside the University are excellent, and could not be matched in a British publication.

It is, however, somewhat odd to find a book in which the elementary rules of arithmetic rub shoulders with chromatography, rheology, radiochemistry and the fascinating details of work flow-processes in a hospital pharmacy. One cannot held feeling that the size of the volume could be reduced by the pruning of elementary and redundant material.

*L. G. Goodwin*

Trowell, H. C. [O.B.E., M.D., F.R.C.P.]. **Diagnosis and Treatment of Diseases in the Tropics. Baillière's Elementary Tropical Handbooks for the Use of Students in Tropical and Sub-Tropical Countries.** 3rd Edition. pp. xi + 332, 37 figs. 1956. London: Baillière, Tindall & Cox, 7 & 8, Henrietta Street, W.C.2. [12s. 6d.]

This is one of a series entitled *Baillière's Elementary Tropical Handbooks*—a series designed for the use of students in tropical and subtropical countries. The books were originally called *Medical Manuals for Africans*, and, with the object of helping those whose knowledge of English is limited, they have been simply written, idiomatic expressions have been avoided and technical terms are clearly defined and explained.

The selection of material has been done with commendable care. In the first chapters the significance of the common symptoms and signs encountered in tropical disease is discussed along with the principles of medical diagnosis. Surgical diseases are similarly dealt with and, throughout, conditions of special tropical importance are emphasized. Attention, for example, is drawn to the frequency of gonorrhoea and tuberculosis as well as of yaws as causes of bone and joint disease presenting surgically in the tropics. Conditions producing fever are next described and it is good to see influenza and measles included along with malaria, sleeping sickness and leprosy. Most physicians in the tropics will agree that there the influenzal infections are all too commonly overlooked as causes of fever, and, particularly in the absence of adequate laboratory facilities, are commonly misdiagnosed as malaria. General medical diseases, the helminthic infections, diseases of the skin, eye and nervous system are included and there are chapters on venereal diseases, diets and malnutrition, diseases of children and drugs and prescriptions. The book is therefore wide in scope but it is not superficial, and into the 332 pages there is packed a wealth of well-ordered essential information —sufficient to enable those practising in the tropics to deal with the great majority of problems likely to be encountered.

The author has written especially with the needs in mind of students in tropical Africa but those in other parts of the world will not find the book lacking. Throughout, there is evidence of an awareness of the

special ways in which problems may present in Africa and of the difficulties which may be encountered in dealing with African patients.

It is clear that Dr. Trowell has given great thought to the preparation and revision of this work and must have diverted much of his energy from his extensive researches into its preparation. In doing so he has performed a very real service to the students and young doctors of the tropics generally and particularly to those in Africa. The result of his labour is a volume which cannot be commended too highly to them.

[The second edition of this book was reviewed in this *Bulletin*, 1945, v. 42, 1050.] *A. W. Woodruff*

It is with the greatest regret that we record the death on 6th August 1956 of Sir H. Harold Scott, *K.C.M.G.*, M.D., F.R.C.P., D.P.H., D.T.M. & H., F.R.S. (Ed.). Sir Harold acted as a Sectional Editor of the *Tropical Diseases Bulletin* from 1922 to 1930, was Assistant Director of the Bureau of Hygiene and Tropical Diseases from 1930 to 1935, Director from 1935 to 1942 and from that date until his death was a regular contributor to the publications of the Bureau.

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